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The First Paper Devoted to the Production of Non-Metallic Minerals

XXII · July 1, 1931 · No. 7

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Vol. XXII CHICAGO, JULY 1, 1931 No. 7

Superior to Control Pacific Coast Cement

IMPORTANT NORTHWEST DEAL

A deal, important in the annals of the Pacific Northwest cement industry, was completed last month, when Superior Portland Cement, Inc., leased the plant and quarries of the Pacific Coast Cement Co.

Under the terms of the contract, Superior, as now constituted, will handle all the manufacturing and sales activities of the two companies but will continue to use the Pacific Coast Cement Company's "Diamond" brand for that portion of its product manufactured in the Pacific plant.

The Superior Company has its plant at Concrete, Wash., while Pacific operates a plant in Seattle.

While the terms of the deal were not made public, it is known that the properties have been leased for a period of years with an option to extend the lease.

Terms of the arrangement were based upon the findings of A. G. Croll, who was formerly vice president and general manager of the Atlas company, up until the time United States Steel acquired the company, and is now a consulting engineer.

Annual capacity of the Superior plant is 1,700,000 barrels and that of the Pacific Coast Cement Co. is 1,100,000 barrels.

Pacific Coast Cement, a subsidiary of the Pacific Coast Company, holding concern for a number of industrial firms in the Northwest, was formed in Washington in 1927.

Properties of the company include nineteen acres at Seattle, an electrically-operated cement plant, a limestone deposit on Dall island, Alaska, and a clay deposit near its plant.

Pacific Steamship Co., a subsidiary of the Pacific Coast Company, will undertake to transport the limestone from the Alaska property to the Seattle plant at an agreed cost.

Through the deal Superior Portland Cement places itself in a position to take advantage of the improved conditions that should ultimately occur in the cement industry. In addition to the economies in manufacturing and in transportation that are possible under arrangement, Superior is enabled greatly to broaden its market.

Superior in addition to its large plant at Concrete has limestone deposits adequate for the operation of the plant for many years. The company also owns a hydro-electric power plant which supplies about 63 per cent. of the power requirements of the cement mill and has an undeveloped power site capable of producing enough additional power to furnish the company's total needs.

Alaskan Asbestos Mine to Enlarge Operations

Roux-Shiedley Asbestos Quarries, with main offices at Kansas City, Mo., recently announced an investment in machinery and equipment of $75,000 and the intention of operating the company's Alaskan asbestos mine on increased scale this summer. A railroad will be built from Bear Creek to the mine. Branch offices of the company will be in Douglas and Juneau, Alaska.

Buys 1,000-Acre Granite Deposit in Empire State

The Hudson River Stone Corp., North Hempstead, L. I., N. Y., has taken over more than 1,000 acres of granite properties near Cold Spring, Putnam County, N. Y., and will install machinery for a new granite cutting and finishing plant, including hoisting, conveying, loading and other equipment.

Four Additional Loading Bins to Boost Capacity

The Moundsville Sand Co., Moundsville, W. Va., is reported to be planning an addition to its car-loading bin structure, to consist of four bins furnishing an additional 1,000 tons capacity. The present 250-ft. gallery conveyor will be extended to 400 ft. to increase the stock-piling capacity.

Seeks Permit to Dredge Gravel from Ohio River

The Smiley Sand & Gravel Co. has applied to the war department for a permit to dredge sand and gravel from the bed of the Ohio River along the Indiana shore in the reach between 530 and 531 miles below Pittsburgh, the material to be used for Federal Aid highway improvements Nos. 198 and 168 in Gallatin county, Ky.

Road Builders Chose Detroit for '32 Meet

SET JAN. 9 TO 15 AS DATES

The twenty-ninth annual convention and show of the American Road Builders' Assn. will be held in Detroit, January 9 to 15, 1932.

The decision as to the location of the road show was made recently by association officers after consideration of the advantages of several large cities that made strong efforts to get the road show.

The Detroit Airport building will be used for both the convention and the road show. All exhibit space is on the ground floor and the huge doors make possible the setting of the largest equipment without difficulty.

A new plan of housing delegates will be followed this year. An effort will be made to house all road builders whose interests are alike in the same hotel, city people in one hotel, county in another, Pan-American in still another and so on through the list. This plan will facilitate locating people at their hotels.

Headquarters hotels will be the Statler and the Book-Cadillac. Division headquarters will be maintained at these hotels. Hotel accommodations for delegates will be better than ever before.

All convention meetings will be held on the second floor of the Airport building, where commodious and quiet rooms are available. Four convention rooms will be in use continuously throughout the convention to care for the many division meetings.

At the Detroit shows all classes and types of equipment and material for the construction, maintenance and operation of streets and highways will be on display.

The event in past years has brought together as many as 25,000 road builders, representing all classes of activities. This number will be exceeded at the Detroit convention and include state, county and city officials, contractors, highway engineers, manufacturers and distributors. The purpose of the event is to present new developments in methods, materials and machines for road and street work and to provide an opportunity for road builders to inspect and compare the new developments in equipment and road materials.

Crushed-Stone Plant in Kentucky Opened

CONTROL SYSTEM IS FEATURE

One of the most modern and best equipped crushed stone plants in Kentucky began operations recently when the Hopkinsville Stone Co. started producing at its plant one mile north of Hopkinsville, Ky.

The new plant has a normal output of 1,000 tons of stone in 10 hours and can be speeded up to 1,200 tons. About 30 men are employed at present.

The machinery is operated entirely by electricity and there is not an exposed belt or wire in the entire plant. In addition to this precaution there are safety controls scattered over the place which makes it possible to stop the machinery at almost any point in case of an accident.

A. W. Partee is president of the Hopkinsville Stone Co. W. H. Petrie is first vice president, and H. F. Young is second vice president. A. M. Andrews is secretary-treasurer. The company is capitalized at $50,000 and the plant is valued at $75,000.

Quarry Withdraws from Proposed Plant Merger

According to W. C. Sparks of Cedar Bluff Quarry, Princeton, Ky., that concern has withdrawn from the group of plants which are to be known as the General Aggregates Corp. The management of Cedar Bluff Quarry and its personnel are to remain the same as in the past.

Bon Ami Co. to Develop Deposits in Carolinas

The Bon Ami Co., of New York, is reported to be arranging with J. C. Pitman to develop extensive mica and feldspar deposits on Chalk Mountain, at head of Crabtree Creek near Spruce Pine, N. C.

Dredges Material From River Bed 60 Ft. Deep

The H. D. Conkey Co. has operated a sand-and-gravel dredging plant at Oregon, Ill., for a number of years, producing commercial material from the bed of the Rock River at a depth of as much as 60 ft. below the surface of the water in some instances.

Material is handled from the dredge by a 12-in. Erie pump operated by a 200-hp. motor. The dredge has been operated with an Erie pump for more than 20 years.

Wisconsin Producer to Erect New Gravel Plant

The Wissota Sand & Gravel Co., of Eau Claire, Wis., has purchased a tract of land from Edward Novak of Haugen, Wis., to be developed as a gravel pit.

A spur track to the pit which is located on the west bank of Bear Creek is to be erected shortly. About thirty men are to be given employment when work starts some time this month.

Pioneer Builds Another Tru-Mix Concrete Plant

The Pioneer Sand & Gravel Co. is proceeding with the construction of another of its Tru-Mix concrete plants in Seattle, Wash. The new operation represents an investment of $20,000 in equipment, it is said, and is located at 901 N. Fairview Ave. The plant site is 126 ft. deep by 40 ft. wide.

Ohio Stone Association Employs Chief Engineer

Announcement has been made of the appointment of F. E. Swineford of Akron, O., as chief engineer of the Ohio Crushed Stone Assn. Mr. Swineford has taken up his duties at the association's headquarters at Columbus.

Philadelphia Quartz Co. in Operation 100 Years

The Philadelphia Quartz Co., Philadelphia, on July 21 will have completed a century in business. The enterprise was founded in 1831 by Joseph Elkinton for the manufacture of soap and candles. In 1861 the company started manufacturing silicate of soda, in addition to its other products, and in 1904 soluble silicates became its exclusive product.

Fire destroyed the plant of the Idaho Lime Co. at Evans, Ida., recently with a loss exceeding $25,000.

Dewey Quarry Blast Loosens 110,000 Tons

6,000 FEET OF FUSE EMPLOYED

The Dewey Portland Cement Co. recently detonated a blast at its quarry near Davenport, Ia., which, while not over average size and involving no unusual methods, is of interest because unusually clear photographs were taken of the blast. These are reproduced below.

The conditions under which the blast was made approximate those of the average quarry, for which reason the methods used and the results obtained should interest most quarry operators.

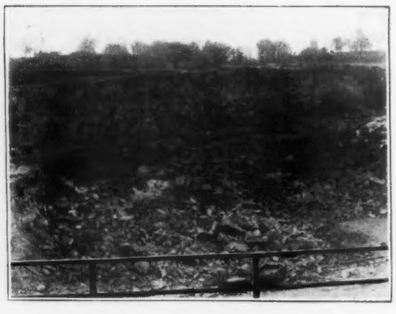
This company, in addition to cement, also produces crushed stone for aggregate purposes and agricultural limestone. For this reason, and because of the nature of the deposit, the quarry is worked in two 40-ft. levels. The upper level is known as Cedar Valley limestone and is used for cement rock. The lower level is known as the Upper Davenport limestone and is suitable for aggregate. Below these two levels is a 40-ft. deposit of Lower Davenport limestone which has not yet been opened.

Each of the two levels now being worked has its own shovel, locomotives, cars and incline to the crushing plant so that either type of material can be produced independent of the other. A Bucyrus, 100B 3-cu. yd. electric shovel on the lower level loads the stone to be crushed as aggregate into Eastern 6-cu. yd. Phoenix-type steel cars which are hauled to the foot of the incline by a 15-ton Davenport gasoline-electric locomotive. A Bucyrus 50B 2-cu. yd. electric shovel loads the cement rock on the upper level into the same kind of cars. These are hauled to the second incline by a 15-ton and a 30-ton locomotive, both Davenport gasoline-electric. All primary drilling is done with Keystone 6-in. well drills.

The blast with which this article is concerned was in the lower level and consisted of 76 holes each 44 ft. deep. Trojan dynamite and Cordeau fuse were used, 13,850 lb. of the explosive being 60 per cent and 12,300 lb. 40 per cent. Over 6,000 ft. of Cordeau was used. It is estimated that about 110,000 tons of rock were brought down by this blast.

Dewey quarry before the blast.

View in quarry as blast took place.



After the blast. Note the shattered stone.

Trophy Dedicated at Canada Cement Plant

350 PRESENT AT CEREMONIES

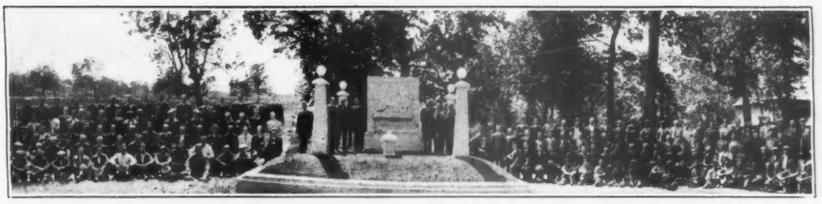
On an ideal day and in the presence of over 350 employees of Plant No. 8 of the Canada Cement Co. and representatives from safety organizations and cement plants in Canada and the United States, the rededication of the Portland Cement Assn. safety trophy took place at Port Colborne, Ont., on May 27.

The trophy, which was erected in 1926 when this cement plant completed the calendar year of 1925 without a lost-time accident, was rededicated because of the same feat accomplished in 1930. A. C. Tagge, director of the Portland Cement Assn. and past chairman of its Bureau of Accident Prevention and Insurance rededicated the trophy. Mr. Tagge spoke of the interest taken by the association in the work of safety in the member plants. He congratulated the employees of the plant on their excellent record and on behalf of the association thanked them for the honor they had brought to their plant. His closing message was to the effect that all of the employees should resolve that they were not rededicating the trophy, but rather that they were rededicating themselves to carrying on the accident-prevention work.

J. D. Johnson, president of the Canada Cement Co. officially accepted the rededication on behalf of the company.

Previous to the ceremony at the scene of the trophy the employees lined up in their respective departments at the plant and with a representative from each department carrying a banner showing how many days its workers had gone without a lost time accident, marched to the trophy.

L. M. McDonald, plant superintendent, acted as chairman and introduced the following speakers: R. B. Morley, general manager of the Industrial Accident Prevention Assn., Toronto; J. B. Zook, safety engineer of the Great Lakes Portland Cement Co., Buffalo, New York; Mark Vaughan, M. P. P. for Welland; H. G. Jacobsen, sales manager, Bates Valve Bag Co., Chicago.



Part of the crowd at the Canada trophy dedication ceremony.

Wisconsin Granite Plant to Be in Operation Soon

The Rainbow Granite Co., formerly of Sacred Heart, Minn., has opened a black granite quarry near Mellon, Wis. Equipment installation is nearly completed, and shipment of rough-sawed stone will commence very soon. According to reports present plans include the construction of a finishing plant in Mellon as soon as quarry production is well under way. Company's holdings in Sacred Heart are reported to have been sold.

Marion Gravel Co. Buys Indiana Plant's Assets

Articles of incorporation have been filed with the secretary of state in Indianapolis by the Marion Gravel Co., having its principal place of business in Marion, Ind. The company recently purchased the assets of the Grant County Gravel & Sand Co. for $12,500. The company has an initial capital stock of 250 shares having a declared par value of $100 each. The incorporators were Frank L. Deer, Leon L. Deer, S. G. Cohen, L. A. Young and Walter Fudge, all of Franklin, Ia.

The Shelton Concrete Products Co. has purchased the concrete products business of E. R. Ballinger, in Seattle, Wash.

Builds Gravel Plant at Sault Ste. Marie, Mich.

The Igneous Sand & Gravel Co. has been incorporated in Detroit, Mich., with a capital of $25,000, and with offices at 1013 Dime Bank Building. The company will, it is reported, develop a plant on a deposit at Sault Ste. Marie, Mich.

Bay Bridge, Ohio, Plant Dedicates Safety Trophy

On May 27 the Bay Bridge, O., plant of the Medusa Portland Cement Co. dedicated its safety trophy. There were about 800 persons present at the ceremonies. A band of 70 pieces from the Sandusky High School furnished music for the occasion. The principal speaker was Cong. Feisinger, of Sandusky. The picture shows the trophy in its imposing setting.

The Bay Bridge plant trophy.

BUILDING AND ALTERATION PERMITS IN MAY, 1931, COMPARED WITH MAY, 1930, AND APRIL, 1931

State	May, 1931	May, 1930	April, 1931	State	May, 1931	May, 1930	April, 1931
Alabama	$ 429,662	$ 677,150	$ 523,481	Nebraska	$ 452,340	$ 1,077,029	$ 340,097
Arizona	243,642	521,549	188,051	Nevada	165,810	217,650	131,850
Arkansas	18,895	40,243	17,758	New Hampshire	97,633	61,781	62,607
California	11,986,283	19,655,287	11,421,565	New Jersey	3,882,834	7,136,954	4,492,419
Colorado	1,029,410	960,245	1,267,600	New Mexico	113,257	131,251	122,302
Connecticut	3,001,884	4,469,318	2,320,701	New York	47,008,825	47,764,532	67,618,210
Delaware	370,931	423,731	135,112	North Carolina	846,395	790,970	450,902
District of Columbia	4,933,579	3,032,412	2,206,680	North Dakota	90,629	140,148	106,172
Florida	1,086,609	2,953,747	1,095,496	Ohio	12,445,684	12,960,256	6,124,455
Georgia	411,059	567,251	308,891	Oklahoma	1,973,190	3,310,650	1,400,475
Idaho	87,464	351,104	70,721	Oregon	583,478	1,422,749	986,277
Illinois	3,741,275	16,105,168	6,056,791	Pennsylvania	6,294,331	10,623,453	11,700,973
Indiana	1,272,021	2,187,639	1,972,760	Rhode Island	723,755	2,640,720	964,415
Iowa	1,102,544	2,091,191	2,025,545	South Carolina	205,540	405,603	199,605
Kansas	351,187	1,103,347	277,882	South Dakota	249,647	239,260	275,330
Kentucky	631,367	2,372,611	588,175	Tennessee	749,864	3,366,148	961,137
Louisiana	366,370	475,502	2,866,215	Texas	5,100,663	5,833,571	4,627,699
Maine	66,262	159,861	117,872	Utah	443,426	461,606	343,253
Maryland	3,380,455	3,736,618	5,917,920	Vermont	83,000	27,000	15,000
Massachusetts	6,715,292	7,351,596	5,987,411	Virginia	731,044	1,152,191	899,652
Michigan	4,793,881	10,358,034	6,304,199	Washington	2,012,315	4,225,879	2,024,893
Minnesota	3,593,570	3,514,332	3,084,771	West Virginia	202,369	473,488	281,242
Mississippi	50,835	308,868	75,900	Wisconsin	2,915,289	6,090,634	4,965,988
Missouri	2,201,353	4,598,575	5,983,580	Wyoming	39,190	30,675	43,430
Montana	120,720	109,540	161,870	Totals	$139,467,981	$198,709,117	$170,115,330

Court Holds Georgia Rates on Gravel Fair

BRANDEIS READS OPINION

The action of the Interstate Commerce Commission in prescribing freight rates on shipments of chert, clay, sand and gravel within the state of Georgia, has been held by the Supreme Court of the United States to have been clearly within the power of the commission and not arbitrary nor repugnant to the sovereignty of the state. The case was brought to the land's highest court by the Georgia Public Service Commission and the Highway Board of the same state.

In the inception of the case, the commission, after extensive hearings prescribed certain distance rates as maximum reasonable rates for inter-state single-line and joint-line hauls between points in Georgia and points outside the state. At the same time the commission found no reason for the establishment of different rates on the same commodities, distances considered, within the state of Georgia, but entered no order on intra-state shipments, depending on the state commission to prescribe corresponding rates on intra-state shipments in the interest of harmony.

When the state commission refused to act the railroads petitioned it to order into effect a set of rates on intra-state shipments that would coincide, distances considered, with the rates prescribed by the Federal commission for inter-state shipments of chert, clay, sand and gravel. The state commission, however, refused the petition of the roads and at the same time directed them to establish a scale of rates lower than those applicable on inter-state shipments of these products.

The railroads complied with the order of the Georgia commission, but immediately appealed to the Inter-state Commerce Commission to re-open the case to determine whether or not the action of the state commission granted an undue preference to intra-state commerce and tended, in effect, to obstruct inter-state commerce. Thereupon, the case was reopened, further hearings were held, and the railroads were "ordered" to make effective a scale of tariffs, "which shall not be lower, distance considered, than the rates contemporaneously applicable" to interstate commerce.

Then the Georgia Public Service Commission asked the Federal court for Georgia to enjoin the operation of the commission's order and when that appeal proved successful carried the matter through to the Supreme Court of the United States.

Justice Louis D. Brandeis, who read the opinion of the Supreme Court, swept aside the technical objections of the appellants with the statement that: "It is not our province to inquire into the soundness of the commission's reasoning, the wisdom of its decisions, or the consistency of its conclusion with those reached in similar cases. The facts to which our attention is called furnish no support for the charge of arbitrariness or of invasion of the sovereign rights of the state."

The contention of the state commission that the Federal body in its consideration of the application of the railroads on the question of intra-state rates should have gone into the matter of fairness of the inter-state rates, was answered with the statement that the question had been settled in the former hearing.

It was held also by the court that since the operation of the commission's order involved shipments from and to many places and under varying conditions, typical instances might be considered, thereby over-ruling another objection of the state.

Cars Ride on Aerial Cables over Tramway

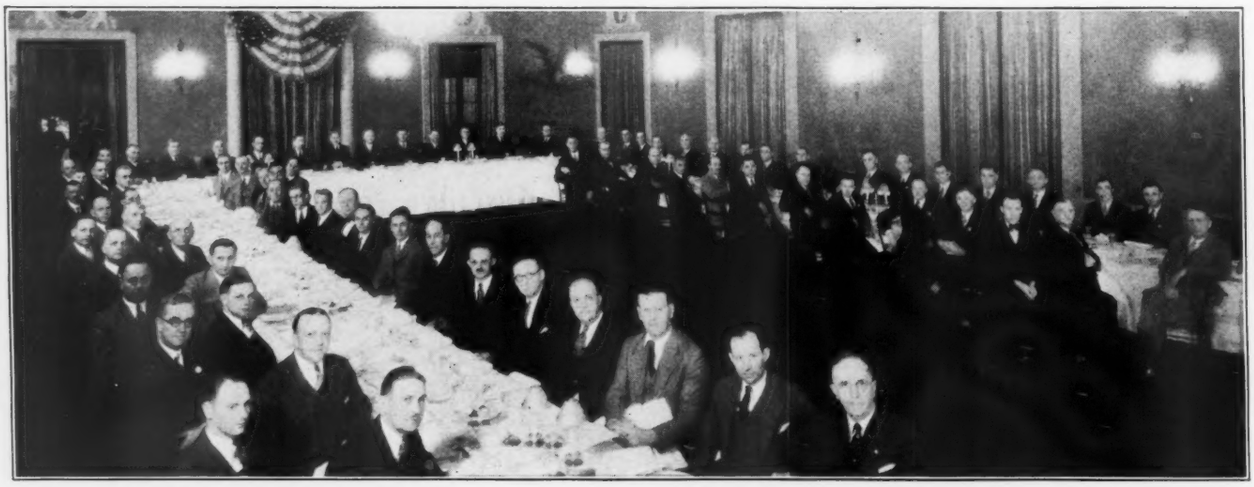
INSTALLED AT KAOLIN PLANT

Installation of an aerial-cable tramway, with cars riding on track cables instead of being suspended, has been completed to replace a railway and dump car system for handling overburden stripped from a clay deposit of the Georgia Kaolin Co. at Dry Branch, Ga.

The material is a sticky gumbo or sandy loam, and sliding of the spoil bank caused continual trouble in maintaining tracks. With the new equipment, cars from the power shovel now operate only in the pit and dump into a central hopper directly over the loading terminal of the tramway. Owing to the sticky character of the material an automatic, electrically-operated batch-measuring device was applied for charging the continuously moving tramcars, which are of ⅔-cu.yd. capacity.

Each car has four small wheels riding on a pair of stationary track cables and is permanently attached to an endless-traction cable driven by an electric motor. There are two sets of track cables, one above the other, and at the discharge end of the line the cars dump by tipping over endwise as they transfer to the return line, on which they travel in inverted position.

The discharge end is carried by a 60-ft. tower, and a stream of water causes the material to spread and flow into a ravine. This tramway, with a capacity of 200 cu.yd. per hour, is ½ mile long and has a 22-deg. incline at the pit, which is 20 to 50 ft. deep. It was built by the Interstate Equipment Corp., New York, N. Y., which also designed the special loading device.



The above picture shows the representatives from 43 cement plants throughout the United States and Canada who were present at the luncheon safety session of the spring meeting of the Portland Cement Assn. at the Hotel Biltmore, New York, on May 12, to receive the formal award of the 1930 safety trophies. Each cement plant which had operated throughout the 1930 season without a lost-time or fatal accident was entitled to send two delegates to the meeting at the expense of the Association.

Outstanding Quarry Safety Records Are Awarded Recognition

THE remarkable growth of the safety movement is again demonstrated by the awards made to a large number of mines and quarries participating in the National Safety Competition for 1930 in recognition of the long-time operation of their properties with no accidents or with decidedly low accident rates. The National Safety Competition is conducted annually by the United States Bureau of Mines. In letters addressed to the companies receiving trophies and to those given honorable mention, Scott Turner, director of the Bureau of Mines, states that an annually increasing number of companies are succeeding in operating their properties with unusually favorable records in the prevention of accidents. The National Safety Competition, he stated, is proving a very effective safety movement, largely because its competitive features make a strong appeal to both mining companies and their employees.

More than 300 large operations participated in the competition during 1930. Seventy-two of these went through the year without a single lost-time accident. Contestants were divided into five groups, four of them comprising underground operations, as follows: anthracite, bituminous coal, metallic ore, and nonmetallic mineral; and the fifth including quarries or open-cut mines. A replica of the bronze trophy, "The Sentinels of Safety," donated by the *Explosives Engineer*, was awarded to the winner in each group.

In the nonmetallic-mine group, the trophy was awarded to the Lower gypsum mine of the United States Gypsum Co., Gypsum, Ohio, which worked 108,090 man-hr. without a single lost-time accident. Honorable mention in this group was given to the Wampum limestone mine of the Crescent Portland Cement Co., Wampum, Pa., which worked 100,687 man-hr. without a lost-time accident; the Akron gypsum mine of the Universal Gypsum & Lime Co., Akron, N. Y., working 64,647 man-hr. with no accidents; the Retsof rock-salt mine of the Retsof Mining Co., Retsof, N. Y., working 307,214 man-hr. with but 1 accident causing 55 days of disability; and to the No. 6 gypsum mine of the United States Gypsum Co., Plasterco, Va., which worked 151,401 man-hr. with 3 accidents causing 62 days disability.

The winner in the quarry and open-cut mine group was an iron mine. The following-named nonmetallic-mineral operations in this group, which worked the number of man-hours below set forth, operated without a lost-time accident:

LaSalle limestone quarry, Marquette Cement Mfg. Co., LaSalle, Ill., 296,997.
Cape Girardeau limestone quarry, Marquette Cement Mfg. Co., Cape Girardeau, Mo., 224,514.
Columbia Division limestone quarry, Pittsburgh Plate Glass Co., Zanesville, Ohio, 189,751.
Holston limestone quarry, American Limestone Co., Mascot, Tenn., 174,653.
Ormrod cement-rock quarry, Lehigh Portland Cement Co., Ormrod, Pa., 164,193.
Mason City limestone quarry, Lehigh Portland Cement Co., Mason City, Ia., 158,814.
Rock Hill trap-rock quarry, General Crushed Stone Co., Rock Hill, Pa., 157,633.
Fogelsville limestone quarry, Lehigh Portland Cement Co., Fogelsville, Pa., 145,790.
Spore limestone quarry, National Lime & Stone Co., Spore, Ohio, 143,000.
Nos. 5 and 6 limestone quarries, North American Cement Corp., Martinsburg, W. Va., 141,706.
Chanute limestone quarry, Ash Grove Lime & Portland Cement Co., Chanute, Kan., 133,993.
Petoskey limestone quarry, Petoskey Portland Cement Co., Petoskey, Mich., 132,725.
Dewey limestone quarry, Dewey Portland Cement Co., Dewey, Okla., 126,401.
No. 3 limestone quarry, Pennsylvania-Dixie Cement Corp., Richard City, Tenn., 118,089.
Holland limestone quarry, France Stone Co., Maumee, O., 104,183.
Hercules cement-rock quarry Hercules Cement Corp., Stockertown, Pa., 100,611.
Birmingham limestone quarry, Lehigh Portland Cement Co., Tarrant City, Ala., 100,320.
Greencastle limestone quarry, Lone Star Cement Co., Indiana, Inc., Greencastle, Ind., 99,712.
Clinchfield limestone quarry, Pennsylvania-Dixie Cement Corp., Clinchfield, Ga., 99,423.
Security limestone quarry, North American Cement Corp., Security, Md., 98,048.
El Paso limestone and shale quarry, Southwestern Portland Cement Co., El Paso, Texas, 95,748.
Fordwick limestone quarry, Lehigh Portland Cement Co., Fordwick, Va., 94,560.
Jamesville limestone quarry, General Crushed Stone Co., Syracuse, N. Y., 92,723.
Cement-mill limestone quarry, Lawrence Portland Cement Co., Thomaston, Me., 91,842.
No. 4 cement-rock quarry, Alpha Portland Cement Co., Martin's Creek, Pa., 87,339.
Nazareth cement-rock quarry, Nazareth Cement Co., Nazareth, Pa., 85,224.
Sandt's Eddy cement-rock quarry, Lehigh Portland Cement Co., Sandt's Eddy, Pa., 81,795.
No. 2 limestone quarry, Southwest Stone Co., Chico, Tex., 79,442.
Dallas limestone quarry, Trinity Portland Cement Co., Dallas, Tex., 75,362.
LaSalle limestone quarry, Alpha Portland Cement Co., LaSalle, Ill., 74,844.
Iola limestone quarry, Lehigh Portland Cement Co., Iola, Kan., 73,728.
Bonneville cement-rock quarry No. 1, Lawrence Portland Cement Co., Northampton, Pa., 73,431.
North Baltimore limestone quarry, France Stone Co., North Baltimore, O., 69,776.
Mitchell limestone quarry, Lehigh Portland Cement Co., Mitchell, Ind., 69,536.
Catskill limestone quarry, Alpha Portland Cement Co., Cementon, N. Y., 62,245.
Dixon limestone quarry, Medusa Portland Cement Co., Dixon, Ill., 59,881.
Ridgeville limestone quarry, Mid-West Rock Products Corp., Ridgeville, Ind., 59,231.
Concrete-limestone quarry, Superior Portland Cement Co., Inc., Concrete, Wash., 58,972.
Spencer limestone quarry, Mid-West Rock Products Corp., Spencer, Ind., 54,909.
Oglesby limestone quarry, Lehigh Portland Cement Co., Oglesby, Ill., 54,312.
No. 7 limestone and shale quarry, Pennsylvania-Dixie Cement Corp., Portland Point, N. Y., 52,610.
Kenneth limestone quarry, France Limestone Co., Logansport, Ind., 52,307.
Rocky Hill trap-rock quarry, Connnecticut Quarries Co., Inc., Rocky Hill, Conn., 47,405.
Alpha limestone quarry, Alpha Portland Cement Co., Alpha, Mo., 47,262.
No. 4 cement-rock quarry, Pennsylvania-Dixie Cement Corp., Nazareth, Pa., 45,916.
Mildred limestone quarry, Consolidated Cement Corp., Mildred, Kan., 45,600.
Howes Cave limestone quarry, North American Cement Corp., Howes Cave, N. Y., 44,530.
New Castle limestone quarry Lehigh Portland Cement Co., New Castle, Pa., 41,580.
Mt. Carmel trap-rock quarry, Connecticut Quarries Co., Inc., Mt. Carmel, Conn., 40,522.
Trident limestone quarry, Three Forks Portland Cement Co., Trident, Mont., 37,141.
Bonner Springs limestone and shale quarry, Lone Star Cement Co. (Kansas), Bonner Springs, Kan., 34,134.
Medusa limestone quarry, Medusa Portland Cement Co., York, Pa., 31,728.
State Hospital limestone quarry, Rochester State Hospital, Rochester, Minn., 31,200.
Fredonia limestone quarry, Consolidated Cement Corp., Fredonia, Kansas, 30,114.

The following-named acted as members of the Committee on Award: James F. Callbreath, secretary, American Mining Congress; W. H. Cameron, managing director, National Safety Council; A. J. R. Curtis, assistant general manager, Portland Cement Assn.; A. T. Goldbeck, director, Bureau of Engineering, National Crushed Stone Assn.; William Green, president, American Federation of Labor; C. B. Huntress, executive secretary, National Coal Assn.; T. T. Read, professor of mining, Columbia University.

Editorials

Higher Freight Rates May Help the Shippers

IF the railroads' proposal for a blanket increase in freight rates should win the approval of the Interstate Commerce Commission, producers of nonmetallic minerals, in common with other shippers of large tonnages, may be expected to show increasing interest in motor trucks. Despite their complaint of motor-truck competition and the damage they claim to suffer at its hands, the railroads will only add to their troubles if they succeed in their plea for higher rates. In times such as these, when shippers of all classes are resorting to every device that promises a reduction in operating expense, they must not be blamed if they turn to the motor truck, which every day provides new evidence of its flexibility and adaptability. The requirements of modern business demand the adoption of the most efficient and economical tools available and the motor truck is a conspicuous member of that class.

The motor truck has made such a brilliant showing wherever it has been properly applied, that the exceptional cases of its seeming failure must be attributed to lack of judgment in its use rather than to any shortcoming inherent in itself. Although hundreds of nonmetallic-mineral producers have already adopted motor trucks for handling deliveries within reasonable distances, our industries are still far from being motorized. The shocking lack of interest in motor trucks, found among those who either have not tried them or have not even investigated their possibilities, is the result partly of habit, partly of lack of information, and partly of the absence of any driving force compelling them to examine the opportunities for using trucks effectively. The threat of higher freight rates, coming at a time when raw-material prices have reached points ridiculously low, is certain to supply this driving force in thousands of cases where railroad shipping has heretofore seemed satisfactory in spite of its obvious disadvantages.

The likelihood of the railroads attaining their goal is so great that railroad officials are said to be more optimistic regarding the outcome than at any time since the idea of rate increases occurred to them. Although we favor the restoration and stabilization of prices, we do not believe that the railroads are entitled to any such general increase as they seek. In our opinion, the railroads are lagging far behind other industries in the adoption of modern efficiency standards, due principally, we should say, to a lack of the same kind of creative executive capacity that has carried other industries so far forward. While the last twenty-five years have seen few important improvements in railroad service, some other industries have been revolutionized in the same period. The fact that railroads are not stimulated by competition to exert their organizing and managing ability to the same extent as are other industries is no justification for expecting those industries to bear, in the form of higher freight rates, the high cost of second-rate management in an industry safeguarded by government regulation.

However, if the imposition of higher freight rates should succeed, as we feel sure it will, in driving shippers to the adoption of motor transport, or at least to a careful consideration of its merits, it will have served a useful economic end, and one which the railroads may not have foreseen. In such an event the gains expected to accrue to the railroads might easily pass to the shippers, where they would have the additional advantage of a permanence wholly independent of the temporary conditions which had engendered them. In working for higher rates the railroads are bringing new rivals into the field of competition, and, in so doing, will introduce large sections of our and other industries to the economies of motor transport.

The Future of the Bureau of Mines

IF it is true that few governments understand their subjects, it can be said with equal truth that few subjects understand their governments. The statement certainly holds for the nonmetallic-mineral industries and their lack of understanding of the important work being done by the United States Bureau of Mines. Not many producers are adequately informed regarding its many activities, even when these have a special bearing on their own particular problems, and certainly very few have a reasonable understanding of the many ways in which those activities could be made economically useful through a more hearty coöperation on the part of producers.

Ever since its establishment not so many years ago the bureau has done commendable work within the limits of its means, and Dr. Turner, the present director, has accomplished great things with the facilities at his disposal. Accident-prevention work has been greatly stimulated through the help and direction given by Mr. Adams' division, which has rendered conspicuous service along economic as well as humanitarian lines. In setting up a division for nonmetallic minerals and in the selection of Mr. Thoenen to direct it, the bureau has given invaluable aid to industries which had previously been neglected.

Manifold as are the bureau's activities and important as are its achievements, these must suffer by comparison with what the bureau might do if it were given proper financial support by Congress. In Mr. Thoenen's department, in which most nonmetallic-mineral producers will be primarily interested, the opportunities for still greater work are

tremendous. A comparatively small sum of money wisely expended would make possible much needed additions to the staff for field investigation and would broaden the bureau's work into spheres where it can not now enter. There is much important work to be done in the technical study of the processes employed in nonmetallic-mineral production, some suggestion of this possibility having been shown in the technical papers recently released by the bureau and reprinted in PIT AND QUARRY. In these studies, operating engineers, familiar with every process employed in their respective plants, have described not alone the methods used but the results obtained as well. Informative cost and performance data have been given.

These are but indications of what the nonmetallic-minerals division of the bureau might accomplish if it were better financed. Every nonmetallic-mineral producer who recognizes the value of technical knowledge as applied to his product stands to gain immeasurably from the bureau's work and should heartily endorse any movement which aims to obtain greater financial support for it from public funds. The future value of the bureau is entirely dependent on the aid given it by Congress.

Wages and Hours

UNDER present conditions it is apparent that there is insufficient demand for goods of all kinds to furnish full-time employment for those who, until recently, were actively and gainfully engaged in making them. Our pay-rolls are being distributed among fewer people and, as a result, our consumer buying power is correspondingly smaller.

The unemployed, being without earned income, are drawing upon whatever reserves they may have and, for that reason, are confining their purchases to the bare necessaries of existence. With business at a low level they can hardly be expected to indulge in luxuries, even when the means for buying them exist. Those who are employed do not receive their customary income, either because their base wage rate has been cut, or their hours of employment have been reduced, or for both reasons. With their incomes reduced, they certainly can not, through their restricted buying, make good the deficiency in buying power shown by the unemployed.

Clearly the inequalities in the distribution of our wage payments are an important cause contributing to our unbalanced buying and resulting unbalanced production. This is the condition recognized by Congressman Clyde Kelly of Pittsburgh when he told the convention of the National Credit Retailers' Assn. that the nation's banks are "bursting with money" although the country has 6,500,000 unemployed workers. "The reason for this spectacle is that we have not balanced the purchasing power of industry," he said. "It will be necessary to cut the hours of labor if we are going to establish a balance of production." By which he means that, by shortening the working hours of each worker, more workers will be employed to produce the same volume of output. The wages paid to labor would then be distributed among many more workers than at present and the buying power of those so relieved would be increased to the advantage of both employers and workers.

The method of giving part-time employment to a full working force, instead of full-time employment to only a portion of that force, has been adopted by many producers, but too often it has been accompanied by a reduction in the wage rate. Price cutting has encouraged wage cutting and both have been carried on at a rate that has completely demoralized both the price structure and the wage structure. Business is no better off because of such price cutting, nor is labor better off because of wage cutting. As we have previously pointed out, our national prosperity has grown steadily for many years while wages kept pace or set the pace, and to reduce the rate of wages is to turn our backs on the experience of nearly three-quarters of a century. If wages are not maintained, prices can not be maintained, and there can be no stabilization of either, in our opinion, if reductions in both directions continue unchecked.

John Maynard Keynes, the English economist whose *Economic Consequences of the Peace* displayed such clear thinking in the muddled post-war period, has lent the weight of his opinion to this theory of maintaining wage scales. Lecturing in this country, Prof. Keynes has expressed his belief in the contention that the way out of our present difficulties lies through a restoration of commodity prices to a level which will support the great structure of private and public indebtedness which has been erected in the last twenty years. In his opinion, the maintenance of wages is a necessary part in such a price restoration. It is evident to Prof. Keynes as well as to other thinking persons that shrinking incomes can not buy goods at rising prices, and that wage maintenance is a prerequisite to price maintenance or stabilization.

But the maintenance of wages will not alone solve the problem. It will appease and help those who are employed, but it will render the condition of those not employed still more precarious than it is by tending to keep prices at levels already beyond their reach. If wages be maintained and, at the same time, employment be distributed among a greater number of workers, our economic condition should mend rapidly.

Every one realizes that conditions can not show much improvement until commodities and money circulate in greater volume. Can either condition occur if consumer income is to be reduced or if large sections of the consuming public are forced to remain out of the market? Maintaining wages will preserve buying power where it already exists; distributing employment through shortening hours will recreate buying power where it is now nearly absent.

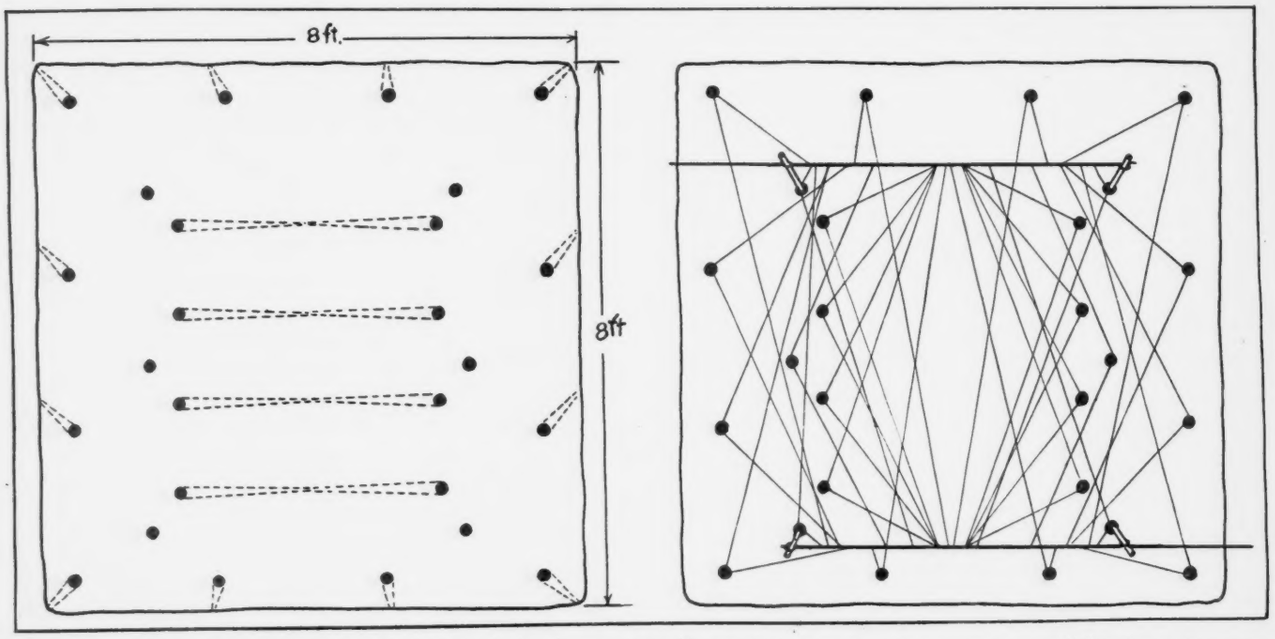
Using Parallel Connections in Electric Blasting in Tunnels and Drifts*

As the advantages of connecting electric blasting caps in parallel become better known, the adoption of this system of connection in tunnels, where power current is available, is coming into greater use. Foremost among these advantages is the avoidance of misfires, due to current leakage from the leg wires, which are likely to occur with a series connection, especially in wet work.

The simplest and easiest method of making parallel connections is by means of buss wires. These buss wires consist of bare copper wires strung across the face, the size usually recommended being No. 14 B. & S. gauge. In a smaller heading No. 16 gauge may sometimes be used. To support these wires, wooden plugs are placed in the collars of two holes on each rib. While these plugs must be firmly fixed in the holes, care must be taken not to damage the leg wires of the electric blasting caps. In 8-ft. by 8-ft. headings, a plug in each of the top relief holes will support one buss wire and another plug in each of the lowest relievers will support the other. One bare copper wire is wound firmly around one of these wooden plugs, stretched horizontally to the plug on the other side of the face, wound around this and fastened so as to hold the buss wire tight. The other bare copper wire is stretched between the two lower plugs in the same manner.

When the buss wires are in place, one leg wire from each electric blasting cap is connected to one buss wire and the other leg wire is connected to the second buss wire, thus making a complete parallel connection of all electric blasting caps in the face. When this is finished, the leading wires are connected to diagonally opposite ends of the buss wires. The use of buss wires permits making tighter joints and hence a more effective circuit than is ordinarily secured by bunching the different leg wires and connecting them direct to the leading wires in parallel.

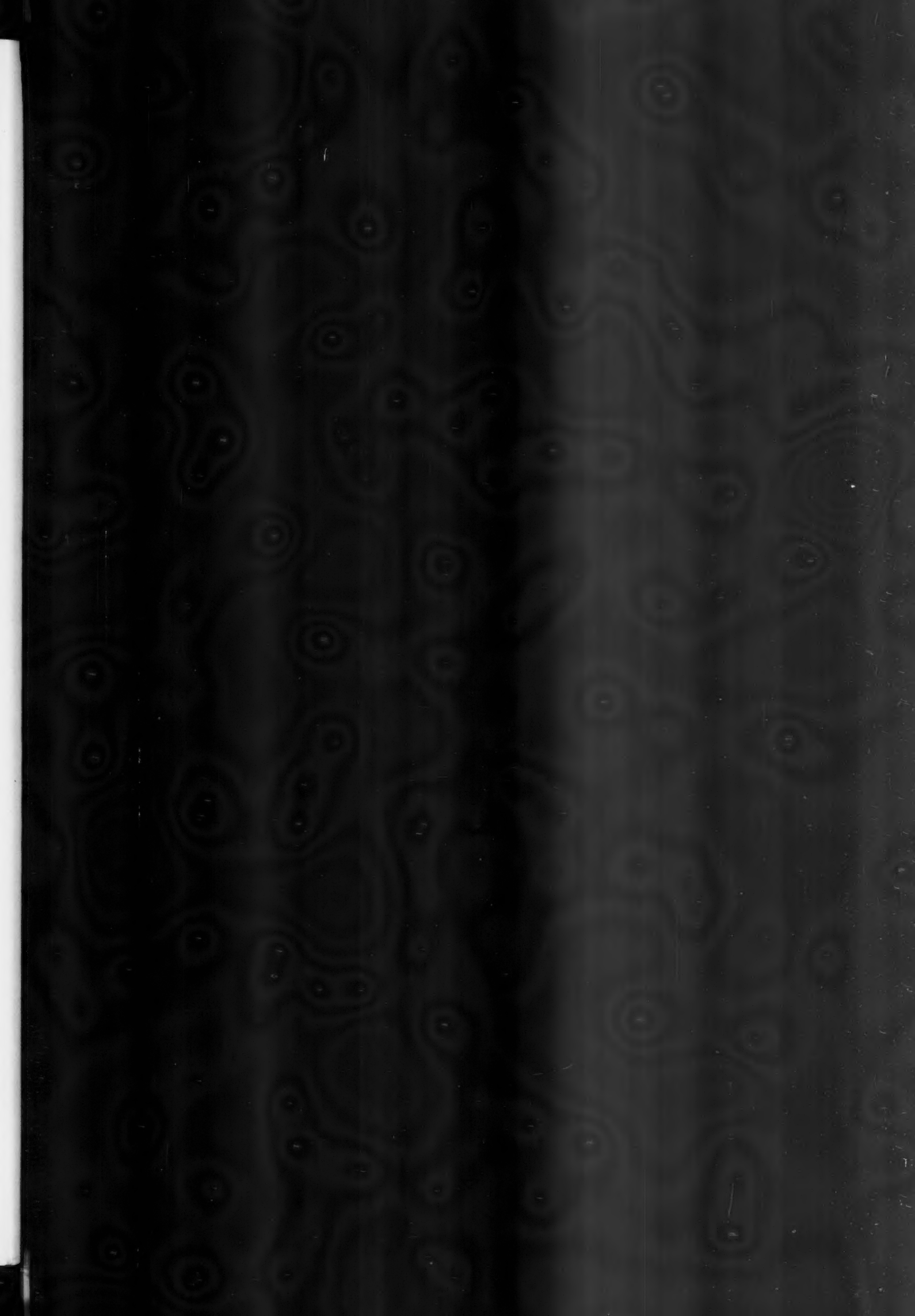
In large faces it is often more convenient to have two, or, occasionally, even more than two sets of buss wires. These sets of busses should be connected in parallel to the leading wires. Where more than one set of busses is used an equal number of electric firing devices should be connected to each set. Otherwise the group having the smallest number of electric detonators will get the most current, fire first and possibly cut out the larger groups. If there is any unevenness in the size of the groups, there should be no instantaneous electric blasting caps in the smallest group. Where the heading is "bone dry" two busses can be fastened to the same plugs with a space of six to eight inches between them. But if there is any possibility that the plugs will get wet, or even moist, between the time of loading and firing this should not be done as the chance that electric current may leak along the plug from one buss to the other is too great.



Typical tunnel-heading round at left. At right, methods of connecting electric detonators in such a round in parallel to buss wires supported on wooden plugs.

It should be kept in mind that with parallel connections a minimum of 0.6 amperes should be provided for each electric blasting cap or delay electric blasting cap and that power current should always be used. Electric blasting machines are designed for use with series connections only.

* From the *duPont Service Bulletin* for April, 1931.



Pit and Quarry

With which is consolidated

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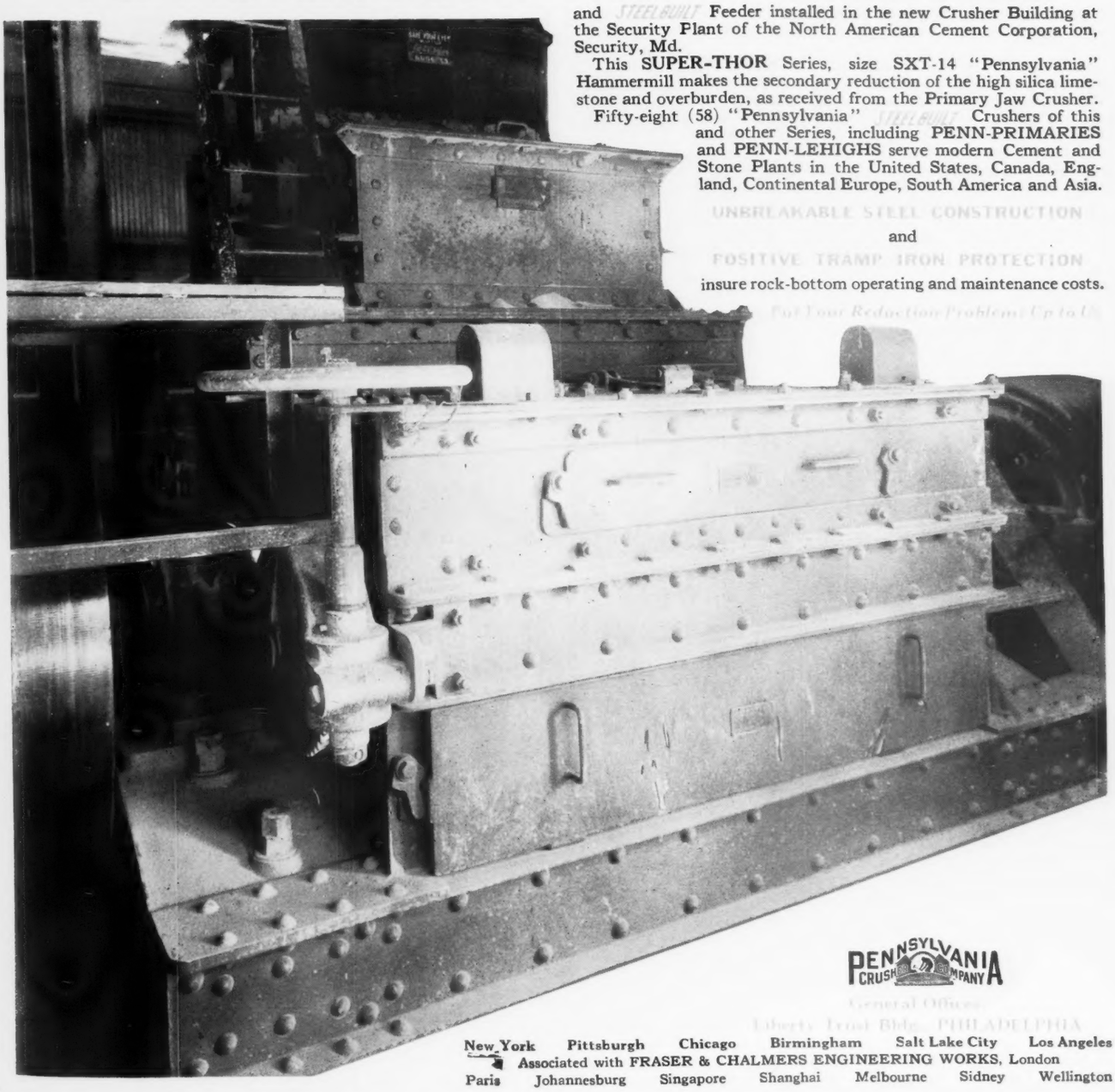
Read in Largest Number of Plants

The First Paper Devoted to the Production of Non-Metallic Minerals

ANNUAL CEMENT MILLS SECTION

"PENNSYLVANIA" STEELBUILT HAMMERMILL



and STEELBUILT Feeder installed in the new Crusher Building at the Security Plant of the North American Cement Corporation, Security, Md.

This **SUPER-THOR** Series, size SXT-14 "Pennsylvania" Hammermill makes the secondary reduction of the high silica limestone and overburden, as received from the Primary Jaw Crusher.

Fifty-eight (58) "Pennsylvania" STEELBUILT Crushers of this and other Series, including **PENN-PRIMARIES** and **PENN-LEHIGHS** serve modern Cement and Stone Plants in the United States, Canada, England, Continental Europe, South America and Asia.

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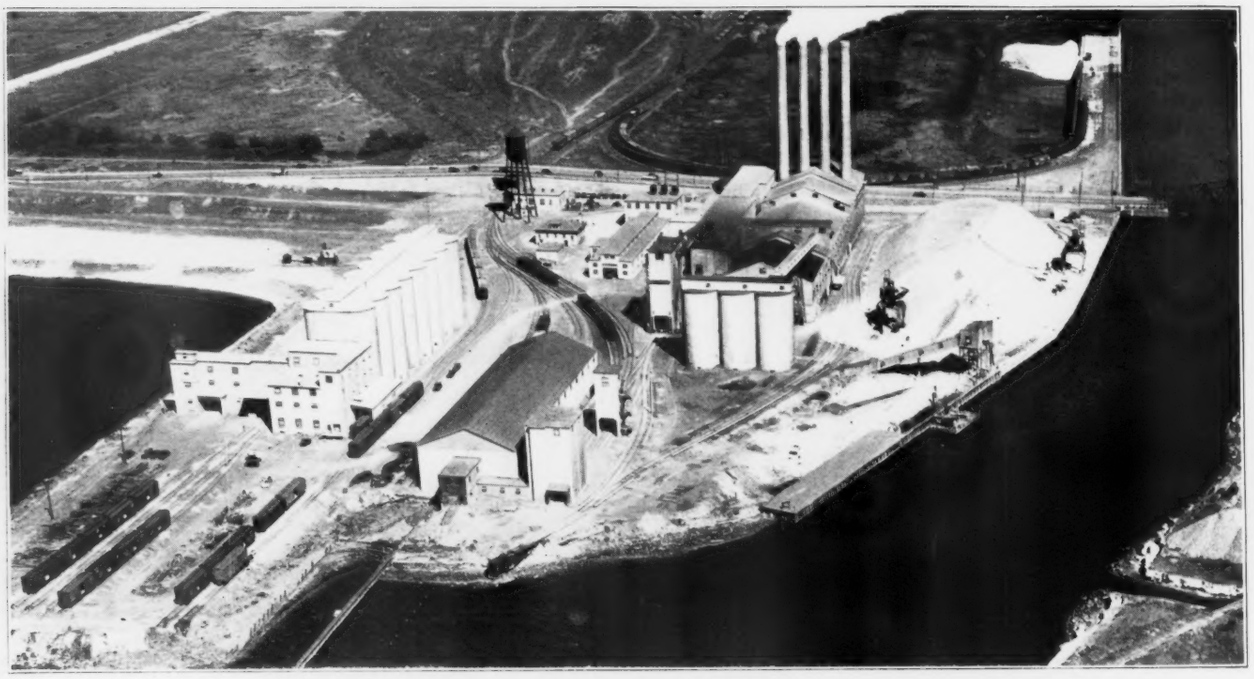
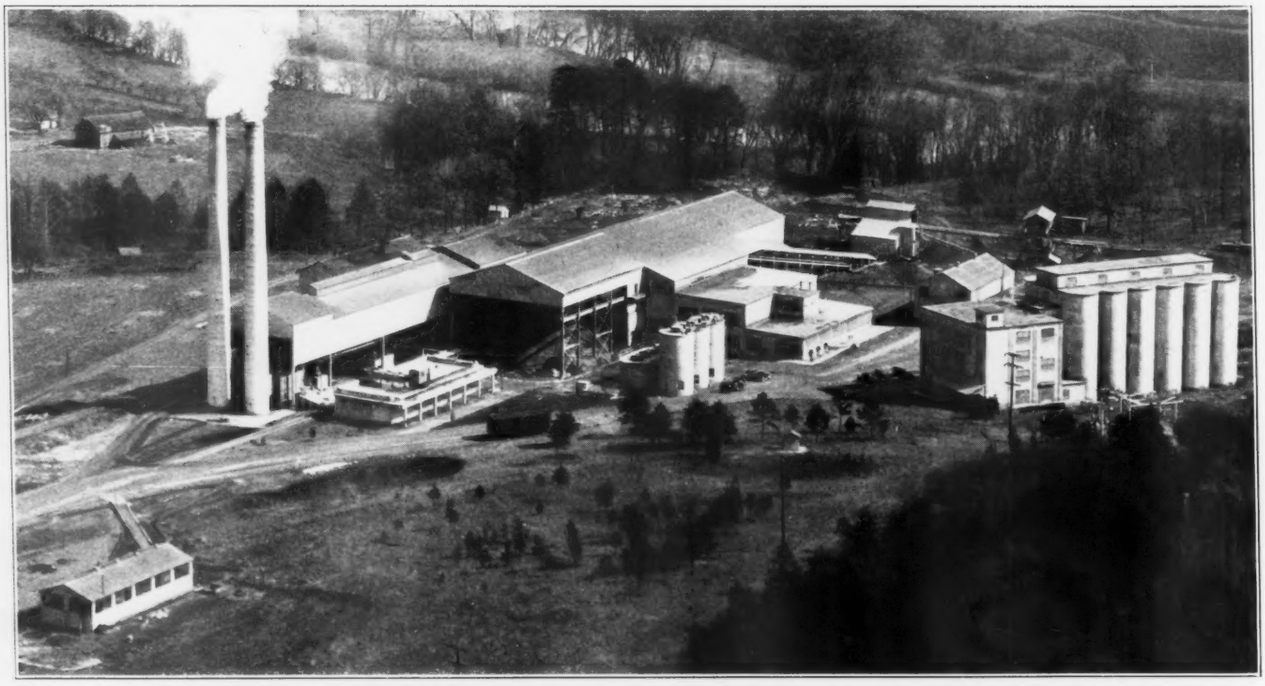


Great Lakes Portland Cement Co., Buffalo, N. Y.



Volunteer Portland Cement Co., Knoxville, Tenn.

BURRELL

ENGINEERING and CONSTRUCTION CO.

DAILY NEWS PLAZA (21st Floor), CHICAGO, ILLINOIS

Aerial view of Great Lakes Portland Cement Corp. plant showing accessibility for water and rail shipments.

Flexible Plan of Handling Raw Materials Used at Buffalo Cement Plant

Third-Rail Car System and Huge Electric Elevator Handle Stone, Shale and Gypsum

By D. W. YIKE
Chief Chemist, Great Lakes Portland Cement Corp.

FOUR years of successful operation in the manufacture of "Lehigh" Portland cement were completed in June, 1931, by the plant of the Great Lakes Portland Cement Corp. at Buffalo, N. Y., and all the expectations of the designers and builders have been more than fulfilled. It is one of the most modern plants in the world and is known as "the cleanest cement plant." It is the belief of the officials of this company that maximum production and quality can be attained only by keeping a clean and orderly plant and that by doing this constantly and systematically it requires but little extra time and effort. A housekeeping campaign is in force at all times, each department being graded on its appearance and, with the extra interest which this campaign creates, each and every employee is forever striving to win for his department the highest honors.

The plant is located in the southern section of Buffalo on the eastern shore of Lake Erie and along the Hamburg Turnpike which is the arterial highway for all points west and southwest. It is bordered on the south by the Union Canal, a deep waterway through which the largest lake freighters can pass with ease and through which the company's rock freighters reach the plant. Here their cargo of crushed stone is discharged on the large storage dock and a cargo of clinker is taken on board bound for the company's grinding plant at Cleveland, O. Cement can also be loaded on barges anchored in this canal for shipment to New York City and intermediate points via the Erie Canal and the Hudson River. Cement is shipped by railroad, trolley, boats and trucks as the plant has ideal connections with these different means of transport.

The crushed limestone, top size being $\frac{3}{4}$ in., is delivered to the plant from northern Michigan by large lake freighters equipped with self-unloading devices capable of unloading over 1,500 tons per hour. The cost of this stone compares favorably with that of normal cement-mill quarry operations and, due to the tremendous size of the quarry from which this material is taken, a limestone of which the chemical or physical properties vary little, if any, from year to year, is assured. The capacity of the limestone storage is 175,000 tons. Lake navigation closes for approximately four months during the winter and as the cement plant operates twelve months a year, this large stone storage is necessary.

The shale quarry owned by the company is lo-

Crawler crane transferring clinker to outside storage.

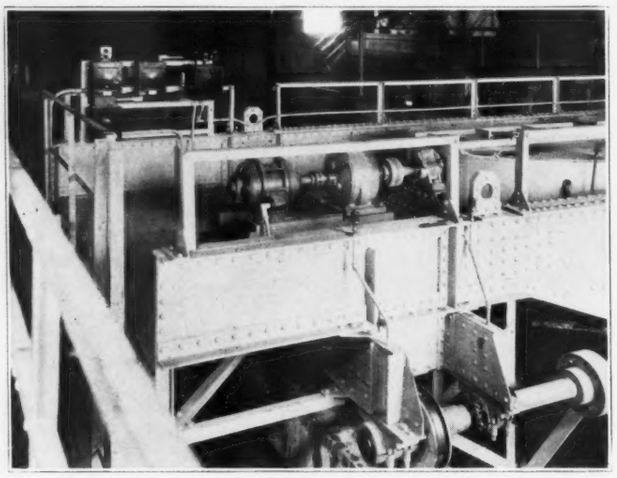
cated at Cloverbank on the Pennsylvania R.R., approximately nine miles south of the plant. The quarry is operated on a two-level basis. The face of the upper level is about fifteen feet in height and is removed, without any blasting or shooting, by a Bucyrus 50-B electric shovel with a 1¾-cu.yd. bucket, utilizing wound-rotor induction motors of the shovel type. This shale which constitutes about seventy-five per cent. of the total shale used, is a soft, fairly uniform material but at times has a tendency to be slightly high in silica. As it is the policy of the company to manufacture a cement which is as uniform, both physically and chemically, as it is possible to make, this occasional increase in silica is neutralized by using the shale from the second level. The depth of this cut is approximately eight feet and as the shale is very hard and firm it requires shooting to break it up.

In drilling this second level for shooting, an Ingersoll Rand S-49 Jackhamer drill is used, equipped with blower tube. The air supply is furnished by an Ingersoll-Rand 5½-in. by 5-in. portable air compressor of 110-cu.ft. capacity. The holes which are 2 in. in diameter at the top and 1½-in. at the bottom, are loaded with 1¼-in. 40-per cent. DuPont gelatin. The Jackhamer drills approximately one and one-half feet per minute in this material.

The reasons for the two-level operation are:

1. At times the upper level shale is just right to use alone;

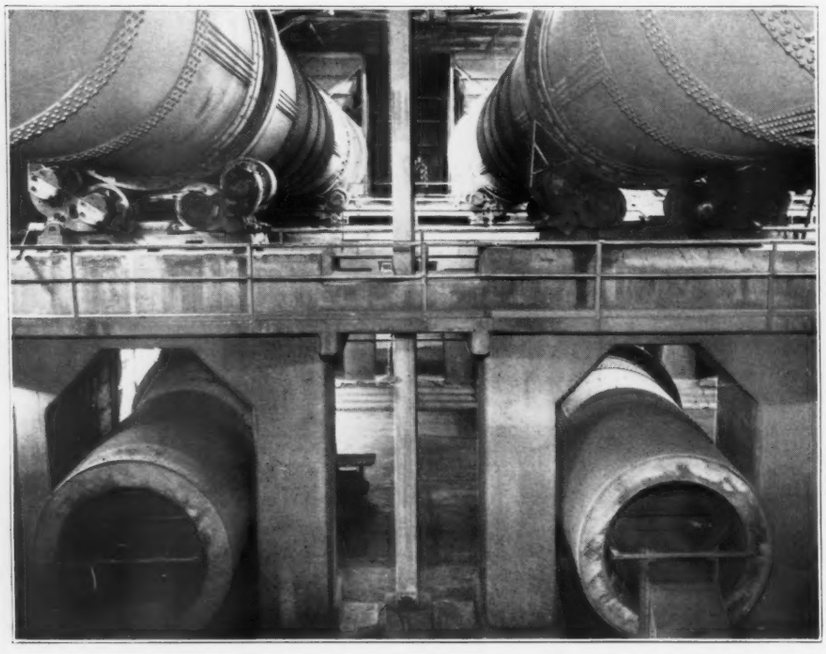
2. It would be extravagant and impractical to drill through the first level of fifteen feet in order to shoot the eight foot bottom shale when it is only needed at certain times and then only in varying amounts.



Traveling-agitator bridge over kiln-feed storage basin.

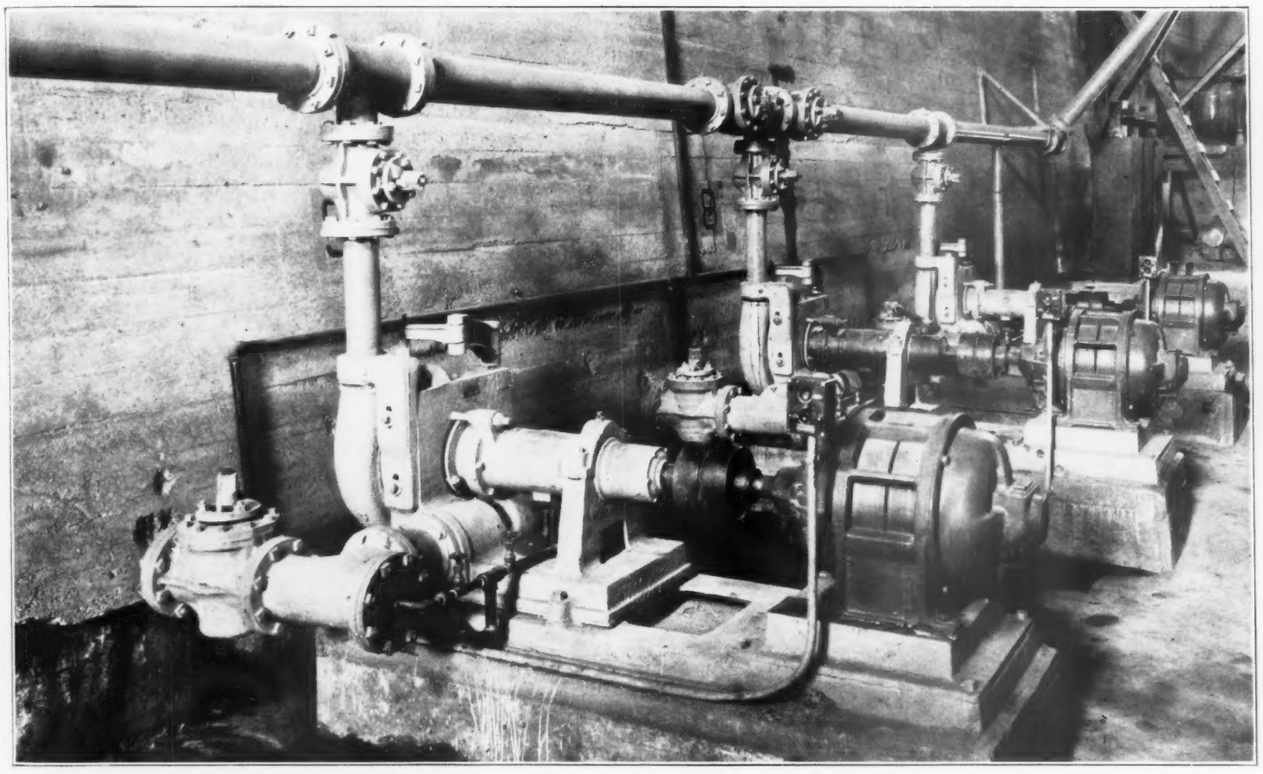
A small ravine in the center of the quarry affords natural drainage, eliminating all pumping expenses or trouble.

The shale is loaded directly into railroad gondola cars by the shovel and is taken from the quarry and placed on the Pennsylvania R.R. siding by a 24-ton, standard-gauge Plymouth gasoline locomotive. A



Two of the four rotary kilns with their clinker coolers below.

Pulverized-coal kiln feeder.



Three of the 4-in. centrifugal pumps used for transferring slurry.

Loomis Clipper electric well drill is used for drilling sample holes.

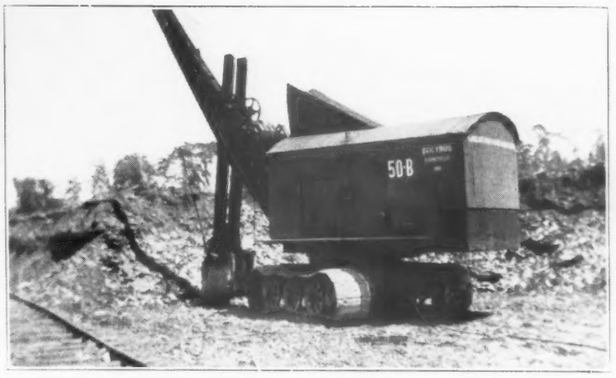
The plant yard is equipped with a complete trackage system making it possible to deliver the various materials to their respective departments with great ease. A large percentage of this track is equipped with a third rail for direct-current haulage. Three direct-current, electric burden-bearing cars, each of 22 tons capacity, and two 20-ton trailer cars are used for the major portion of the hauling. A Plymouth 24-ton, standard gauge, gasoline locomotive is used where the tracks are not equipped with the third-rail system and also for transferring the different materials from the railroad siding to the plant trackage or vice-versa.

Three of the four pulverizers used for grinding coal.

A 200,000-lb.-capacity electric elevator, built and equipped by the Atlas Car & Mfg. Co. is used for lifting the stone, shale, gypsum, coal, etc., to a track floor which is 55 ft. overhead and from which it is delivered to the respective mill bins.

The motor cars used in the third-rail system were built by the Atlas Car & Mfg. Co. and are of the four-wheel bottom-dump type equipped with a 75-hp. motor at each axle. The dumping as well as the brakes are controlled by air. The cars are all standard gauge and are used for switching railroad cars as well as carrying the different materials. The trailers are exact duplicates of the motor cars except for the control cabins with which the motor cars are equipped.

The cars of shale, upon arriving at the plant, are



The electric shovel excavating in the shale quarry.

Jack-hammer drill being used on lower level of shale quarry.

drawn up an inclined track by the gasoline locomotive and discharged into an under-track hopper located in the raw-storage building. A portion of the shale is stored in the uncrushed state while the balance is conveyed by a belt to the Dixie hammer-mill. Here it is crushed to approximately one-inch top size and discharged into a large overhead bin. From this bin, the shale can be distributed as follows:

1. It can be conveyed by gravity through a large steel shaft to the shale storage where it is stored either in the high-silica or low-silica shale bins;

2. It can pass from the overhead bin through four discharge chutes into the motor cars. These cars are then taken up the car elevator to the overhead track floor where the shale is discharged into four bins opposite the rock bins over the raw mills. When the shale is crushed for storage no mixing is attempted but when it is crushed for the mills the high and low-silica materials are mixed by a 3-cu.-yd. Whiting overhead crane. It has been possible to keep a very uniform mixture with this method of mixing. The shale is conveyed to the Dixie hammer-mill by a belt 36 in. wide and 62½ ft. long and is operated at 125 ft. per min. by a 10-hp., 750-r.p.m., squirrel-cage motor with compensator starter. A bucket elevator takes the crushed shale to the overhead bin and is driven by a 25-hp., 750-r.p.m. motor. The mill is equipped with Chain-Belt apron feeders and a No. 40 Norblo dust-collector fan which requires a 15-hp., 1500-r.p.m. direct-connected squirrel-cage motor. The shale mill can crush approximately 100 tons per hour.

The limestone is loaded from the dock storage into the motor cars by two Orton Crane & Shovel Co. electric portal whirler cranes equipped with 5-ton buckets. These cranes are each operated by 187-hp. squirrel-cage induction motors. Four or five buckets of stone will fill a 22-ton car. These cars are then switched to the car elevator and taken to the four rock bins over the raw mills. As the stone is received in a crushed state, the rock bins are equipped with steel grates in order to remove any large or frozen stones which might accidentally become mixed with the regular-sized stone.

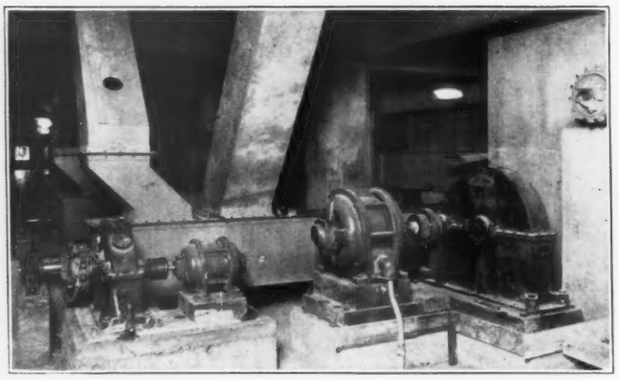
The standard railroad cars in which the coal and gypsum are received are taken directly up the elevator to the track floor and dumped into their respective bins over the mills. The only gypsum storage is in the bins over the mills and therefore no secondary handling is necessary. Coal is also received by water.

Gasoline locomotive switching cars in shale quarry.

A small space in the raw-material-storage building is reserved for approximately 3,000 tons of coal, enough for any emergency which might occur. Otherwise, the proper amount of coal is received daily and dumped directly into the mill bins.

The raw-storage building is a large concrete structure equipped with the overhead crane and provides storage for over 10,000 tons of crushed or uncrushed shale and over 3,000 tons of coal. It is also equipped with a single roll for crushing coal in case it ever becomes necessary to discontinue buying slack coal. The crushed coal from this hammer-mill could be discharged into the motor cars on the track below.

This department is equipped with a 30-in. by 30-

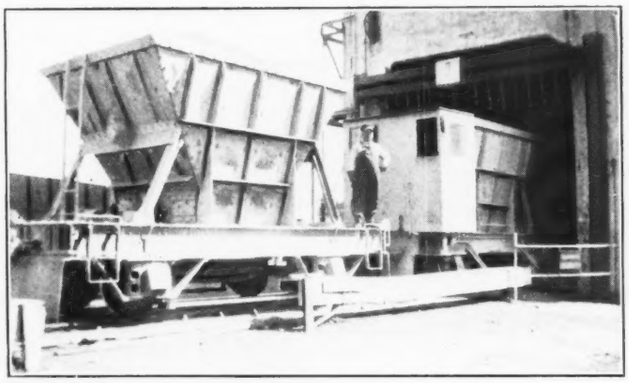


Screw conveyors which remove dust fom precipitators.

in. Jeffrey roll coal crusher, a feeder and an elevator. The crusher is powered with a 25-hp., 750-r.p.m. motor. The elevator is 72 feet long on a 55-deg. angle and is operated by a 20-hp., 750-r.p.m. motor. The estimated capacity of this crusher is 60 tons per hour. The belt conveyors, bucket elevator and pan feeders in both the shale and coal house were supplied by the Chain Belt Co.

The large car elevator, used in raising or lowering the railroad and motor cars to or from the track floor, is a new step in cement mill construction and a general description of it will be given here:

The elevator is rated 100 tons at a speed of 30 ft. per min. and a 55-ft. lift. As already stated, it was built by the Atlas Car & Mfg. Co. The elevator motor is rated 175-hp., 600-r.p.m., 250-volt direct current, with variable generator voltage or Ward Leonard control. The motor-generator set consists of a squirrel-cage 200-hp., 750-r.p.m. motor, a 165-kw. 250-v. generator and a 7-kw. exciter which excites the fields of both the generator and the elevator motor. The power necessary to hoist a load is only equal to the power required to lower the empty platform as the elevator is so counter-weighted.



Motor cars entering car elevator with cargo of limestone.

Raw Grinding

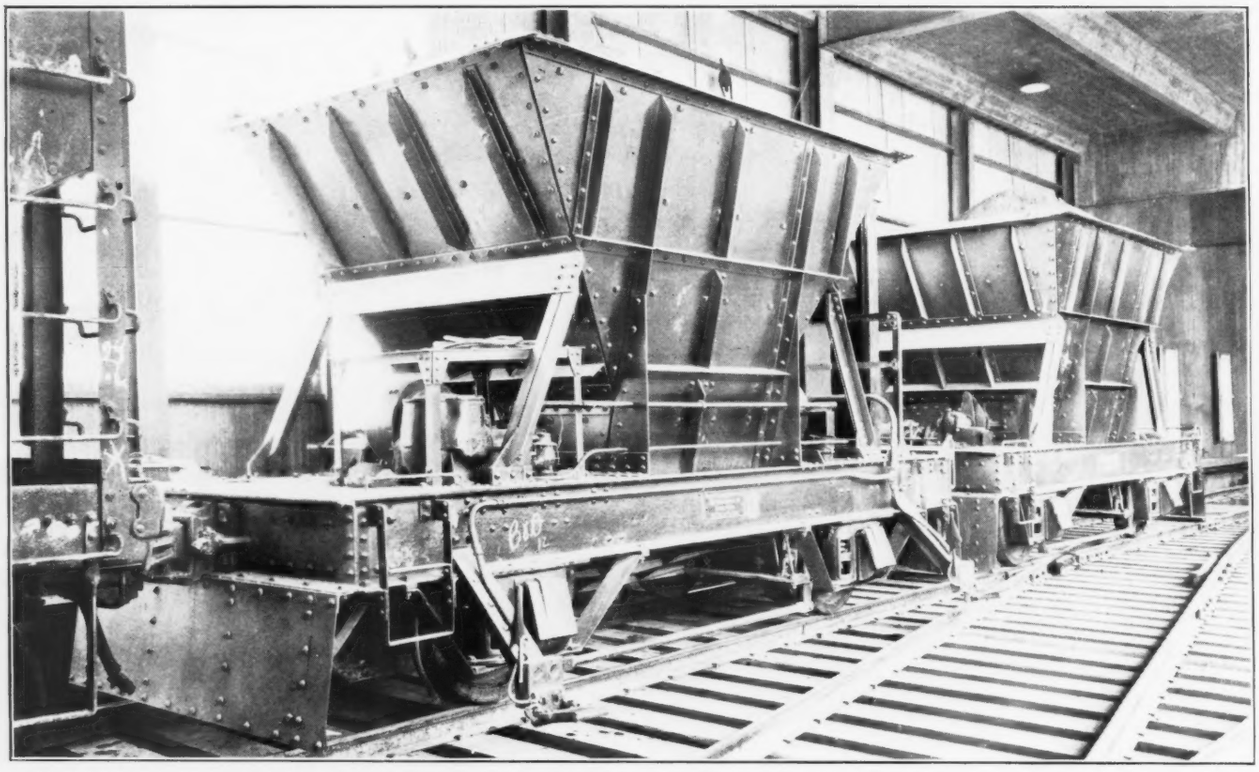
Four Allis-Chalmers 8-ft. by 30-ft. 3-compartment ball mills are used in the raw-grinding department. Each of these mills is driven by an 800-hp. supersynchronous motor running at 187 r.p.m., the gear reduction being taken care of in one step with a ratio of 9.65:1. These mills at full charge require 75 tons of grinding balls. The starting and stopping of these mills is a mechanical operation consisting of applying or releasing the band brakes about the stators. As a safety measure no mill is started until after the miller signals the switchboard operator and receives a return signal from that department that everything is in readiness and that it is safe to start this mill. The shale is discharged from the hoppers into the mills by cradle feeders driven by chains from the mills and the flow of material is controlled by feed gates. The gates on the stone feeds are raised or lowered to control the raw-material fineness and on the shale feeds they are raised or lowered in order to change the calcium-carbonate content of the slurry. A small stream of water discharges into the feed hopper and carries the stone and shale into the mill. The balance of the water is added as the material enters the mill. These four raw mills, each grinding approximately 100 barrels per hour, discharge into one general sump which extends across the entire width of the four mills. This sump is equipped with a slurry ribbon-screw conveyor driven by a 7½-hp. 750-r.p.m. motor.

Steamer "Col. E. M. Young" discharging stone to plant storage.

The moisture in the slurry is kept at 30 per cent. and is so thick that when placed in the tanks the surface will not level as liquids do but still retains a heavy wave-like surface. With this thick slurry, several unique methods of handling are necessary in order to relieve the great strain placed on the slurry pumps.

Three 4-in. Wilfley slurry pumps, each driven by a 50-hp. 1500-r.p.m. motor handle the slurry at this point in the following way: The intakes of the

One of the electric portal whirler cranes in the limestone storage.



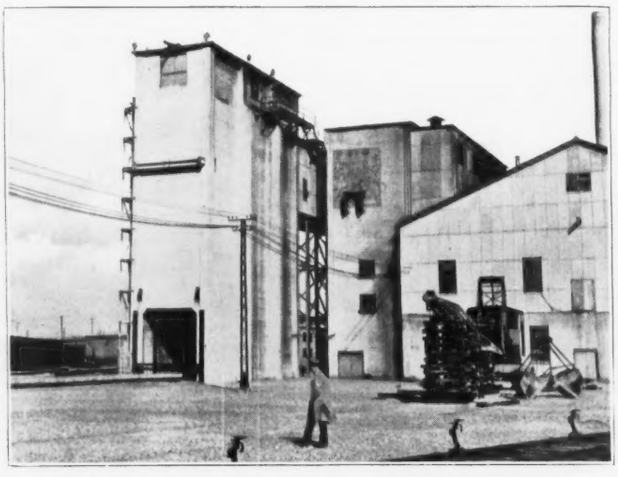
Electric-motor car switching railroad gondola on track floor.

three pumps are equally spaced along the length of the sump. No. 1 and 2 pumps which are located at one end and at the center of the sump respectively, take the slurry from the sump and circulate it through a 6-in. pipe which is located in the sump directly over the screw agitator and which discharges at the far end of the sump over the intake of No. 3 pump. This pump is the only one which pumps the slurry to the mixing tanks. This arrangement increases the capacity of the pumps as one pump will transfer the entire output of the four mills to the mixing tanks more satisfactorily with this system of circulating the slurry than three pumps will with direct pumping.

In order to relieve the strain on the pumps in every way possible because of this heavy and thick slurry, all sharp bends such as elbows have been replaced by round corners in the pipe lines, with a radius of approximately three feet. Also at the bottom of the upright pipe leading to the top of the tanks, which has a lift of 55 feet (approximately) an air booster line has been inserted which, with a small flow of air, boosts the slurry to the top of the tanks, thereby again increasing the capacity of the pumps.

The twelve slurry-mixing tanks are about 50 feet deep with a capacity of 700 bbl. each. They are agitated by a single 1-in. air line which extends to within 1 ft. of the valve in the bottom of the tank. This creates a vigorous circulating motion of the slurry and assures a uniform kiln feed as has been proven by repeated tests. The air pipes are equipped with solenoid valves and a motor-driven time commutator and agitate two tanks at a time for one minute out of every six. A continuous stream of air is kept on the grind tank as it is being filled by the mill stream.

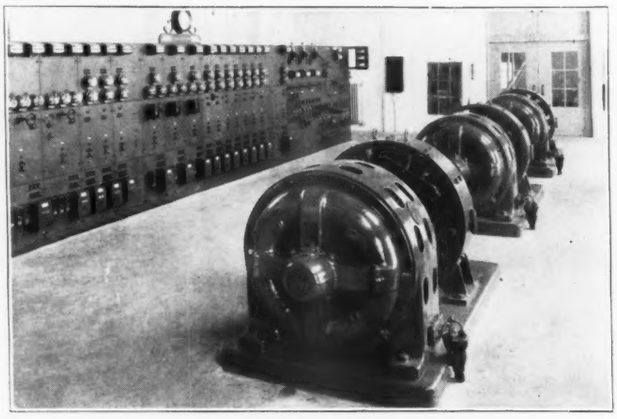
Any one of the twelve tanks discharge in a sump, similar to the one in the raw grinding department. This sump extends the entire length of the tanks which are in two rows of six tanks each. This sump is also equipped with three 4-in. Wilfley slurry pumps and is used for all blending transfers as well as for transferring from the correcting tanks to the kiln-feed storage.



The car-elevator building at left. Kiln building at right.

The kiln-feed storage is a large concrete basin, 89 ft. long, 35 ft. wide and 21 ft. high and is located directly under the four kilns. This basin is equipped with an F. L. Smidth & Co. traveling-agitator bridge, carrying three rotating, vertical paddle

shafts and which makes one complete trip, back and forth, in ten minutes. An air line is attached to the lower paddles to prevent the slurry from building up in the bottom of the basin and also to help in keeping a more uniform raw mix. Air lines are also located along each end of the basin in order to obtain additional agitation. The bridge is moved by a 7½-hp., double squirrel-cage motor. The agitator shafts are driven by a 10-hp. 750-r.p.m. squirrel-cage motor with magnetic control. The slurry is transferred to this storage basin from the mixing tanks through two lines which discharge into opposite ends of the basin and is removed from this storage by three Wilfley pumps similar to the other slurry pumps through a lower outlet located in the center of the basin. The overflows from the kiln feeders also discharge into the end zones, thereby giving a complete circulating movement of the slurry throughout the entire basin resulting in ideal operating conditions.



Three d.-c. motor-generator sets in the switchboard room.

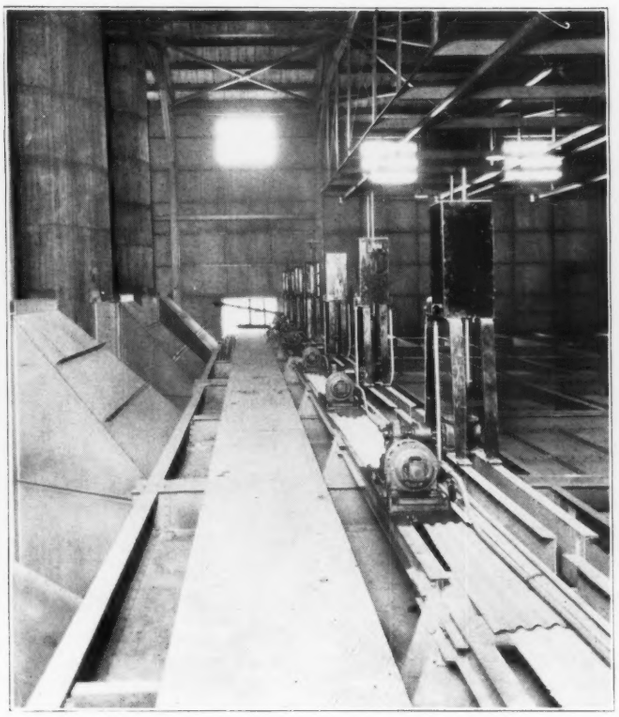
The kiln feeders are the Allis-Chalmers ferris-wheel type and are rotated by adjustable-speed, direct-current motors of 1¾ hp., 300 to 900 r.p.m., and are controlled from the firing floor. Meters, which were manufactured by this company, record the revolutions of the feeders. These meters are similar to a gas house-meter and are geared directly to the main feeder-shaft, making it impossible for an error to occur in the revolutions recorded.

The dust which is collected from the dust precipitators, is put back in the slurry as it leaves the ferris-wheel feeders. Merco-Nordstrom slurry valves are used.

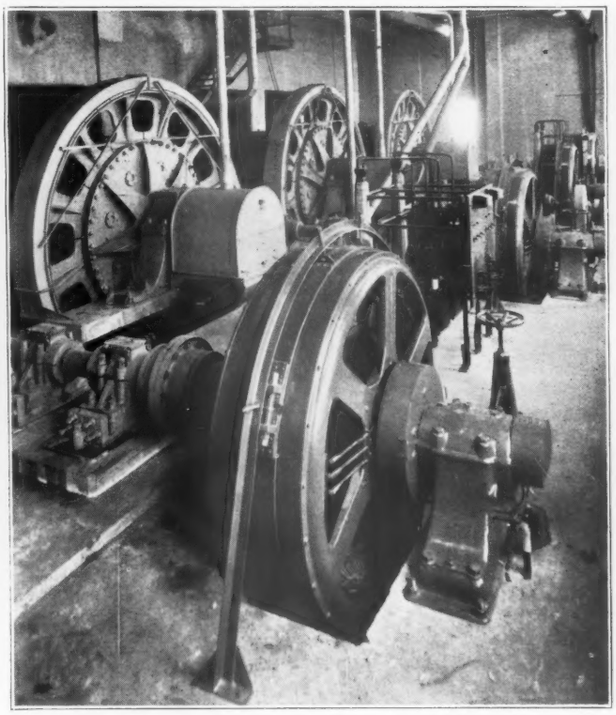
Kiln Room

The four Reeves Bros. kilns are 11 ft. in diameter by 250 ft. in length. They are driven by 100-hp., 375 to 750-r.p.m., 440-v. wound-rotor induction motors at approximately 40 revolutions per hour. The eight kiln dampers are controlled from the burning floor and are regulated by 1-hp., squirrel-cage motors. The dust precipitators are large and roomy, causing practically all the dust to settle out, resulting in clean and dustless smoke. The dust is transferred from the hoppers below these chambers to a Fuller-Kinyon pump by a series of screw conveyors. This pump then hoists the dust to the dust-storage bins located above the kiln feeders.

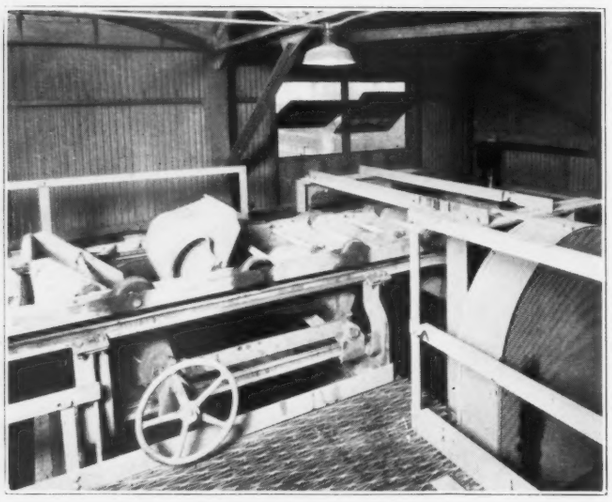
Pulverized coal is fed to the kilns by 6-in. duplex Fuller-Lehigh screw-type feeders which are driven by 1¾-hp., 300 to 900-r.p.m. direct-current motors. Each kiln is equipped with a 50-in. Buffalo Forge Co. special fan, driven by a 30-h.p., 1500-r.p.m. direct-connected, squirrel-cage motor with compensator control, which supplies the primary air



Magnetiç damper controls on precipitators.



Three of the four finish-grinding mills and motors.



Pivoted-bucket conveyor with drive at right.

with the coal through a 12-in. burner pipe. The kilns have been equipped recently with Brown recording pyrometers.

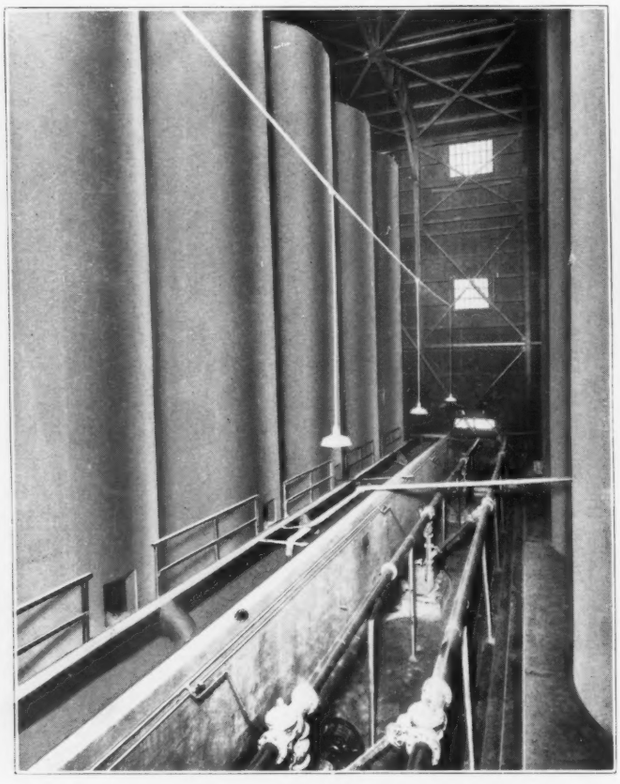
The coolers, which are 9 ft. in diameter by 90 ft. long, were also supplied by Reeves Bros. and are driven by 50-hp., 900-r.p.m. squirrel-cage motors. They can be started or stopped from the firing floor or at the discharge end of the coolers.

The coolers discharge the clinker into a Chain-Belt bucket carrier which operates on 70-ft. center and makes one complete revolution in ten minutes. The clinker is then transferred from this high conveyor level by the three following methods:

1. It can be discharged to a Chain-Belt clinker drag which dumps into any of the four finish-mill hoppers.

2. It can be discharged into a hopper which feeds through a 12-in. metal tube into railroad gondolas placed on the siding just outside the kiln-building wall. From here the cars are switched by the electric motor cars to the main plant track from whence they are taken by the Plymouth gasoline engine to the outside clinker storage. Here the clinker is transferred from the gondolas to the storage by an Orton crawler crane which is operated by a 125-hp. Climax gasoline motor. In the summer months when the clinker is taken from the storage to the finish-mill department, this same crane transfers from the storage to the motor cars and these cars are switched by the gasoline engine to the tracks equipped with the third rail from where they travel under their own power to the car elevator and thence to the auxiliary clinker bin. The clinker is discharged from this bin by a cradle-arm feeder into the bucket carrier, there mixing with the freshly-burned clinker from the kilns and taken by the clinker drag to the finish-mill bins.

3. The clinker can be discharged into a hopper from which it flows through a metal chute on to a traveling rubber belt which operates on an angle of 6 deg. to the top of the clinker-storage bins. The belt is 24 in. wide and 572 ft. long, traveling at the rate of 210 ft. per min., and is equipped with an automatic weight tightener. It is driven by a 20-hp., 725-r.p.m. motor through a Farrel Foundry & Machine Co. speed reducer. The belt discharges the clinker over a chain-drag similar to the one in use over the finish-mill bins and this drag distributes the clinker to the three loading silos. The clinker is then shipped by boat to the grinding and packing plant which the company recently erected at Cleveland, O. A complete description of the Cleveland plant was published in the February 11, 1931, issue of PIT AND QUARRY.



Slurry-blending tanks with transfer pumps and sump.

Loading steamer "Sumatra" with clinker for Cleveland plant.

These three silos discharge the clinkers on to a rubber belt, 48 in. wide and 610 ft. long. This belt is driven through a D. O. James speed reducer by a 150-hp. 725-r.p.m. motor. The belt carries the clinker at an angle of 17 deg. to a loading tower approximately 31 ft. above the level of the dock and discharges into a steel hopper. From this hopper the clinker flows through a 43-ft. telescoped tube into the cargo holes of the large lake freighters which are used for transporting the limestone from

Michigan. The upper section of this telescoped tube is 16 in. in diameter, the lower section is 18 in. in diameter with a variable length of approximately 10 feet. This makes it possible to load several cargo holes without moving the location of the freighters, at the rate of over 5,000 bbl. per hour.

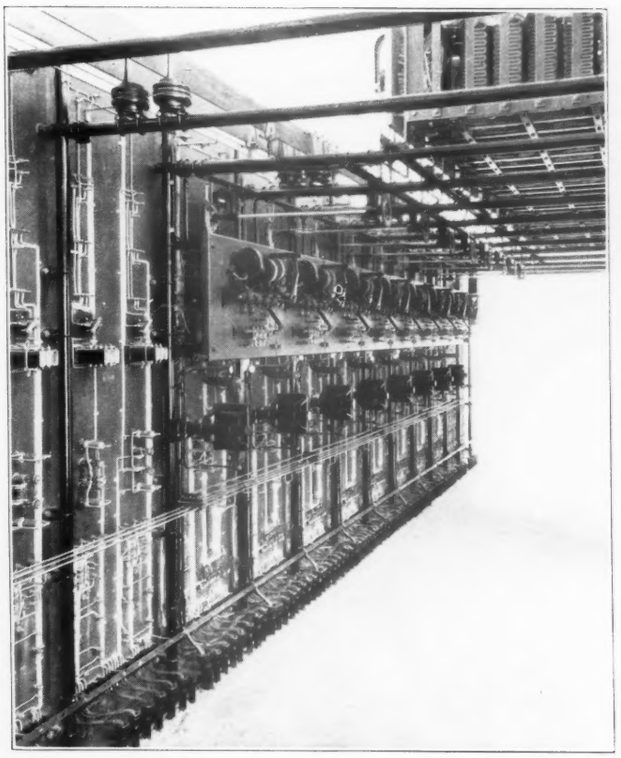
The coal is pulverized by four Raymond Bros. impact pulverizers which are equipped with Fuller-Randolph vertical-type dryers. The coal is dried by the heat taken from the clinker pits beneath the discharge ends of the kilns. Buffalo Forge Co. exhausters are used in removing this heat from the clinker and passing it through the various driers. The heat at the entrance and exit of each of the

Board showing standing of the seven plant groups in the "safety derby."

driers, which is recorded on recording thermometers, is controlled by a Leeds-Northrup heat controller. The mills are of the Raymond low-side mill type and have a capacity of over 5½ tons per hour per mill. The coal passes through eight fans and eight cyclone collectors into a series of screw conveyors by which it is distributed to the different coal bins over the burning floor. The coal level in these bins is controlled by a series of lights and bells, making it practically impossible to have a spill of any kind. All the coal screw-conveyors are interlocked electrically so that any slight plug-up will be recorded immediately in the coal-grinding department, thereby eliminating any delay which might occur from this source. All motors, dampers, controllers, conveyors, etc. are controlled from the ground floor in the grinding department.

Finish-Grinding

Four Allis-Chalmers combination mills similar to the raw mills, i.e., 8-ft. by 30-ft. three-compartment mills, are used for the finish grinding and are driven by 800-hp., 187-r.p.m., 220-v. super-synchronous motors. The clinker feeders are of the revolving circular-plate type and are driven by 1¾-hp., 300 to 900-r.p.m. 250-v. direct-current motors with drum switches and field resistors. The gypsum is fed into the mills with the clinker by a 6-in. screw conveyor which is driven by a separate variable-speed 1¾-hp. motor. The clinker falls from the revolving table into a hopper from where it is fed into the mill by a 13-in. diameter screw. The finished cement is discharged from the mills into screw conveyors which discharge it into hoppers over the cement pumps. Above these hoppers the cement



Rear view of the supersynchronous-motor control panels.

passes through screens driven by 10-hp. motors. Three Fuller-Kinyon 6-in. pumps, each driven by a 100-hp., 1500-r.p.m., squirrel-cage motor, pump the cement through a tunnel approximately 350 ft. long to the cement-storage silos. Here a lift of 96 feet carries the cement to the top of the storage where it is distributed to the various silos.

In the dust-collector room, which is directly over the finish mills, there are ten Northern Blower Co. dust collectors. These discharge in rotation as a motor-driven chronometer valve breaks the vacuum.

The cement storage consists of the following: Sixteen silos 33-ft. in diameter and 80-ft. high with a capacity of 17,100 bbl. each; six small interstices

A view from the loading side of the Cleveland plant.

which are 72 ft. high and hold approximately 4,000 bbl. each.

Four large screw conveyors carry the cement either directly to one Chain-Belt elevator or to a series of cross screw conveyors from where it is taken to any of the other four Chain-Belt elevators. After being discharged from the elevators the cement passes through five Chain-Belt cylindrical rotating screens, into the distributing screws which supply the packer bins. When loading cars in bulk, the cement passes from the rotating screens through a long screw conveyor which discharges it through a 10-in. flexible metal tube into the cars.

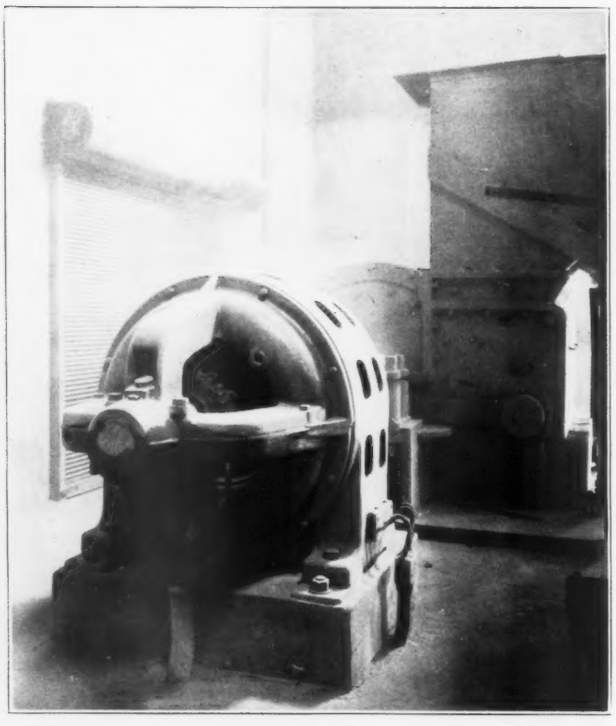
The packing department is equipped with four 3-tube and two 4-tube Bates packers with a packing capacity of over 25,000 bbl. in 24 hours. Continuous belts carry the bags to the loading platforms from where they are trucked to either railroad cars, trucks or boats. The entire packing system is equipped with Northern Blower Co. screen-type dust collectors. On the second and third floors a complete bag department is maintained by the company. This is equipped with a Nazco cylindrical rotating bag cleaner capable of cleaning 30,000 bags daily. The track layout at the packhouse is complete in every way. Three tracks and three spurs have a storage capacity of forty-eight 40-ft. railroad cars. The empty cars are brought down to the loading platform by gravity while the loaded cars are switched by a Caldwell car puller which is so designed that the cars can be moved forward or backward.

A first-class machine shop, completely equipped, is maintained at the plant where all machine and tool work, no matter how large or how small, is well taken care of. The storeroom, which is located in the same building with the machine shop, carries a complete line of mill supplies, repair parts and tools.

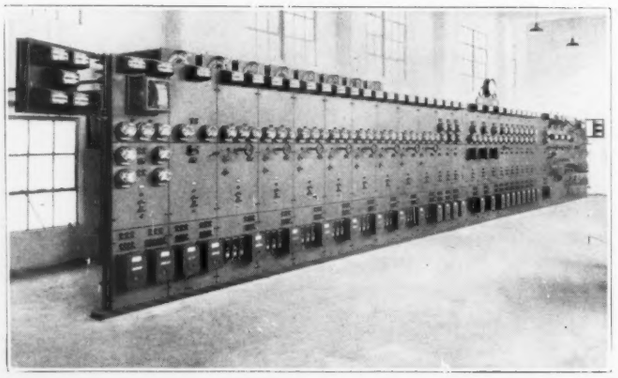
Office of registered nurse in the first-aid room.

The laboratory is located in the building with the plant office and is electrically equipped throughout. No slurry samples are carried into the laboratory for moisture and fineness tests, for the raw-grinding department is equipped with a miniature laboratory where these tests are made. The moisture is determined from the specific gravity of the wet slurry, thereby eliminating the delay which is necessary when drying the samples. This method of testing allows the raw miller to check the slurry moisture and fineness at regular intervals between the hourly samples. This makes it possible to carry a very uniform raw mix.

A heavy stone moist closet designed by the plant chemist and built by the Euclid Mfg. Co., and a series of briquette tanks with running water, are part of the regular equipment. The water is heated by a coil-type water heater and is controlled thermostatically by a mercoid control. The water flowing into both the moist closet and tanks is kept at a temperature of 70 deg. F., plus or minus 1 deg. Just an occasional adjustment is all that is necessary to keep the water temperature within this range. The laboratory not only runs a complete set of tests on the Buffalo product but also makes a similar set of tests on the cement ground at the Cleveland plant. A Riehle briquette tensile tester is also used.



Motor driving the shale hammer-mill crusher.

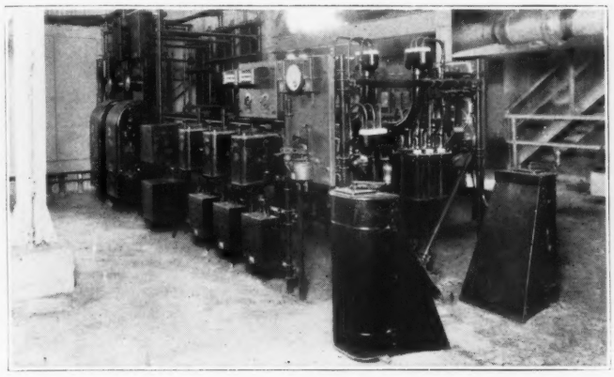


General view of main switchboard.

The entire plant is operated on purchased power, obtained from the Niagara Hudson Power Corp., and is the largest consumer of industrial power outside of the street railway in the city of Buffalo.

Power at 22,000 volts, 3 phase, 25 cycles is furnished over two lines, each capable of operating the entire plant. A three-leg, oxide-film arrestor affords lightning protection. The arrestor, circuit breaker and the instrument transformers are located in a separate room in the transformer building.

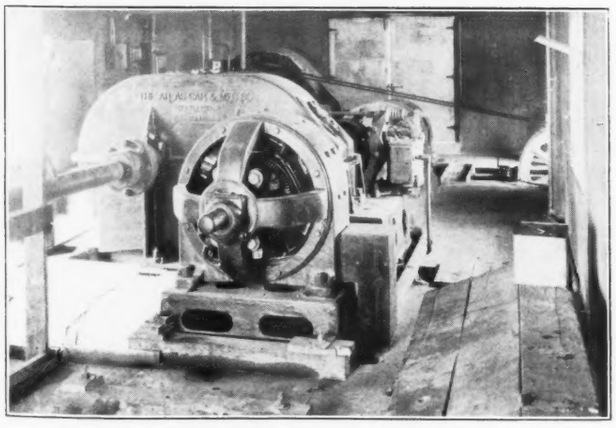
The electric department is located on the first floor of the transformer building while on the second floor is the chief engineer's office and the drafting room.



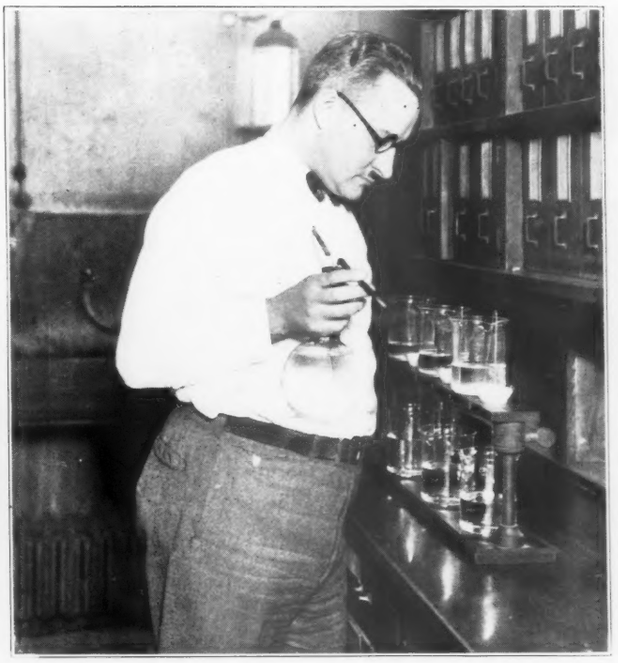
Control units for kiln slurry and coal feed, fans and coolers.

The entire power design and specifications were made in the company's own engineering department and all electrical units, including motors, were purchased from the General Electric Co.

The main switchboard, conceded to be one of the finest in any industrial plant, consists of 26 slate panels mounted eight feet from the back wall of the large well-lighted room. From left to right there is a main feeder panel with meters on a swinging bracket and next, the compensator panel. The next eight panels are for controlling the eight 800-hp. supersynchronous motors on the raw and finish-grinding mills. The eight field rheostats are directly behind these eight panels. The cranes and raw-storage circuit and the air-compressor circuit are controlled by the next three panels. The balance of the panels control the three motor-generator sets which furnish excitation and direct current; the raw and finish-mill auxiliary circuits; the kilns, coal mills, packhouse and car elevator; the third-rail haulage; the plant-lighting system; and the battery-charging panels with a swinging bracket at the end.



The motor and speed-reducer drive of the car elevator.



Daniel W. Yike, chief chemist, making cement analysis.

A first-aid room, completely equipped with all the latest improvements, is located in the plant office building with a registered nurse in charge. The employees are divided into seven groups in a Safety Campaign, a bonus being paid to the groups finishing each month without an accident requiring over two treatments in the first-aid room. The Safety Investigating Committee, composed of three members of the Safety Committee, makes a complete inspection of the plant twice a month and reports at the semi-monthly meeting of the Committee. At this meeting, the report is discussed and the various recommendations acted upon. The company is proud of its safety record, having completed the past two and one-half years without a lost-time accident, and every employee is working for another perfect record this year.

A small automatic electric pump having a capacity of 750 gallons per minute, elevates low-pressure water to a high tank for general manufacturing uses.

The plant was designed by the engineering department of the Great Lakes Portland Cement Co. under the direction of Adam L. Beck, president and general manager of the company. The Burrell Engineering & Construction Co., engineers and general contractors for the plant, coöperated in some of the minor details of the design.

Adam L. Beck, one of the pioneers of the cement industry, is president of this company, Daniel E. Ritter, vice-president, Marshal Beck, secretary and treasurer, A. T. Bevier, superintendent, J. A. McGraw, assistant superintendent, J. B. Zook, chief engineer and safety director, and D. W. Yike, chief chemist.

La Tolteca Erecting 1,200-Bbl.-Capacity Cement Plant at Mexico City

Limestone Quarried 40 Miles Distant Brought to Mill by Bottom-Dump Cars

ONE of the only cement plants being built in North America at the present time, and both of these in Mexico, is nearing completion at Mexico City, D. F., the city of bullfights and senoritas. This is the new 1,200-bbl.-capacity plant of La Tolteca Compania de Cemento Portland.

This company, backed by English capital and whose main office is in London, has operated a cement plant at Tolteca, Mexico, for twenty years, building up a reputation in the industry and the demand for their product to such an extent that an expenditure for a new plant within the city limits of Mexico City was justified to care for that market by direct truck shipments.

The new plant has been designed to include the latest development in cement-plant engineering and construction in order to continue to make cement equal to the specifications required by the high standard established by the company. It is also a model plant to show what can be done with concrete construction because it is reinforced concrete throughout.

The limestone rock is quarried forty miles from Mexico City and is brought to the plant over standard Mexican railway in bottom-dump cars which discharge into a receiving hopper and 30-in. Traylor apron feeder into a No. 5 Williams Mammoth, Jr. hammer-mill. Here it is pulverized and discharged to a belt conveyor and elevator leg which elevates it from the deep crusher pit to an overhead belt conveyor. This belt conveyor discharges the crushed rock to one of three sectional bins located in the end of a material-storage building which is 430-ft. long by 65-ft. wide, and reinforced concrete throughout with a concrete precast tile roof.

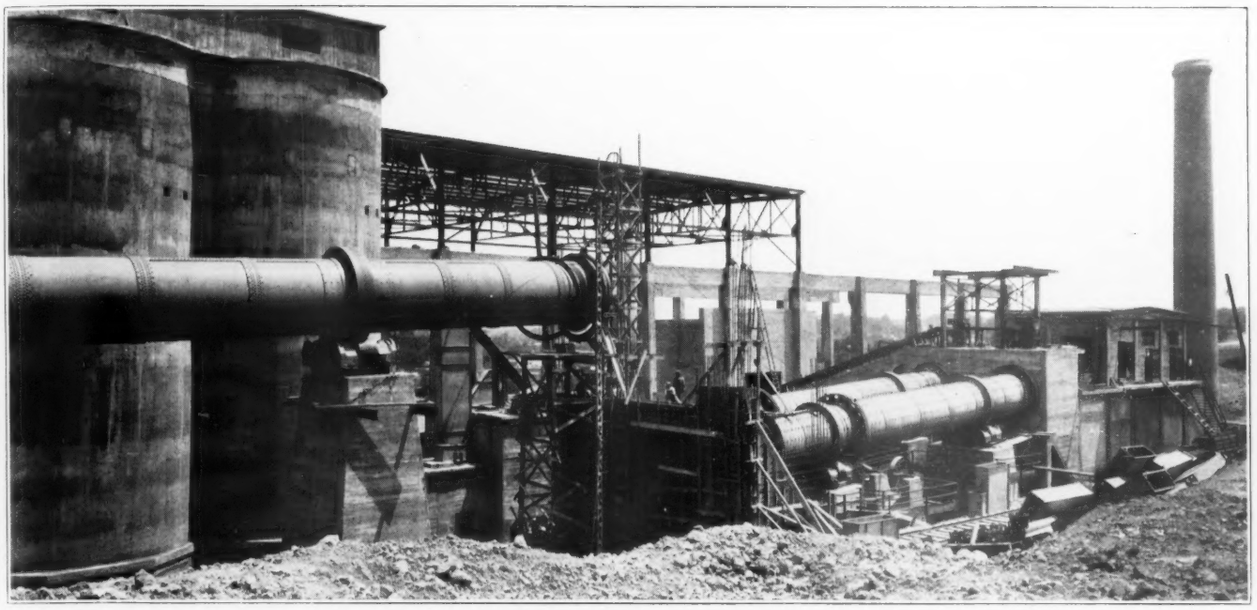
As this storage building serves for gypsum, clay and clinker storage, as well as rock storage, the materials are distributed in the building by means of an overhead traveling Harnischfeger electric crane of 7½-ton capacity.

As the clay deposit at the site on which the plant is constructed is suitable to use as clay in the manufacture of cement, the materials obtained in the excavations for the foundations will be used when the plant starts operating, and future clay requirements will be obtained from a clay bank on the site immediately adjacent to the plant. As this clay is somewhat lumpy, being of a volcanic formation, it is delivered to the limestone receiving hopper and put through the Williams mill and conveying system to be discharged to another of the three open bins at the end of the main materials-storage building where it is recovered by the overhead crane.

Gypsum received on cars is delivered to the material-storage building through the same operation.

Clay and limestone are recovered from the main

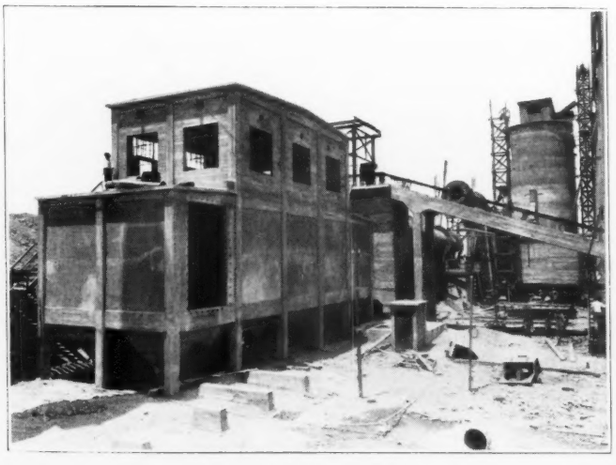
The storage building with mill building and cement-storage silos at right.



Left to right: Kiln, rotary driers, precipitator building and stack.

storage piles and deposited in concrete bins at the side of the storage building, built at an elevation which will just allow the crane bucket to clear the top of the bins. This enables the material to be discharged from these bins on belt conveyors which are inclined to the top of the drier smoke box from which the clay and limestone are fed into each drier, thus eliminating elevator legs.

This part of the design of the plant is rather unusual in that the driers are located between the end of the kiln and Cottrell system, utilizing the waste gases of the kiln for drying purposes. The gases pass from the kiln smoke box through the two Allis-



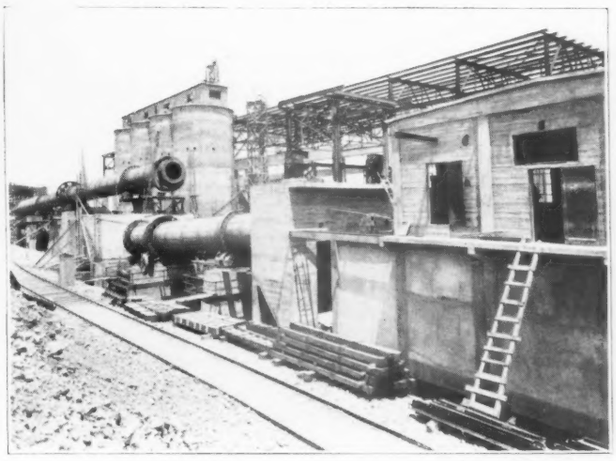
The precipitator building.

Chalmers 7-ft. by 70 ft. rotary driers, through the drier smoke box and then through the Cottrell precipitator building to the concrete stack. The clay and limestone material, passing in the other direction, discharges from the ends of the driers to two screw conveyors which return the material to the materials-storage building where it is reclaimed by the overhead crane and stored ready for grinding.

The raw mill is an Allis-Chalmers Compeb mill, 8-ft. by 7-ft. by 32-ft., driven by a 600-hp. 6,300-volt Allis-Chalmers motor. The material discharges from the mill through a screen and screw conveyor to a 6-in. Fuller-Kinyon pump which conveys it through a tunnel under the materials-storage building to four blending silos 23-ft. in diameter by 40-ft. deep. The blending silos are located parallel to the kiln, discharging through a ratchet-type feeder to a 14-in. collecting conveyor in the basement.

To eliminate any mechanical kiln-feed apparatus on the top of the smoke box, where it is usually located, a special design screw conveyor takes the raw material at ground level to an elevator leg which feeds directly into the kiln feed box. This conveyor is driven by a variable-speed motor and acts as the kiln feed regulator. Being on the ground and easily accessible, the kiln feed is readily controlled.

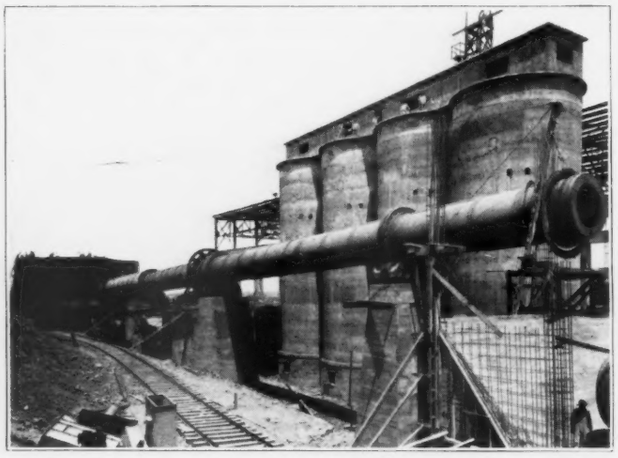
The kiln itself was designed to the specifications of the Tolteca company for maximum efficiency of



Another view of the kiln, driers, and precipitator building.

A plant view with open storage at right.

fuel consumption. This is very important due to the fact that oil, which is burned in the kiln, can only be obtained at excessive cost. The burning zone tapers from 7 ft. to 10 ft.; then tapers back to



The kiln and raw-material-blending silos.

an 8-ft. diameter in the preheating zone. The total length of the kiln is 285 ft. It is mounted on concrete foundations high enough to allow the return cooler, which is 8 ft. by 90 ft., to discharge approximately at ground elevation where an inclined drag

Another view showing cooler under kiln in background.

chain handles the clinker back to the main materials-storage building.

The finish mill is located in the same building with the raw mill, and after the clinker is ground it discharges to one of two 5-in. Fuller-Kinyon pumps to be pumped to the storage silos. The second pump acts as a spare.

There are four storage silos 20 ft. in diameter and 70 ft. deep adjacent to the packhouse which is

Another view of mill building; open storage in background.

three stories high and which contains two 3-tube Continental-type Bates packers. The sacked cement can be delivered by belt conveyor to cars on one side of the packhouse or to trucks on the other side. The bag house adjacent to the packhouse contains

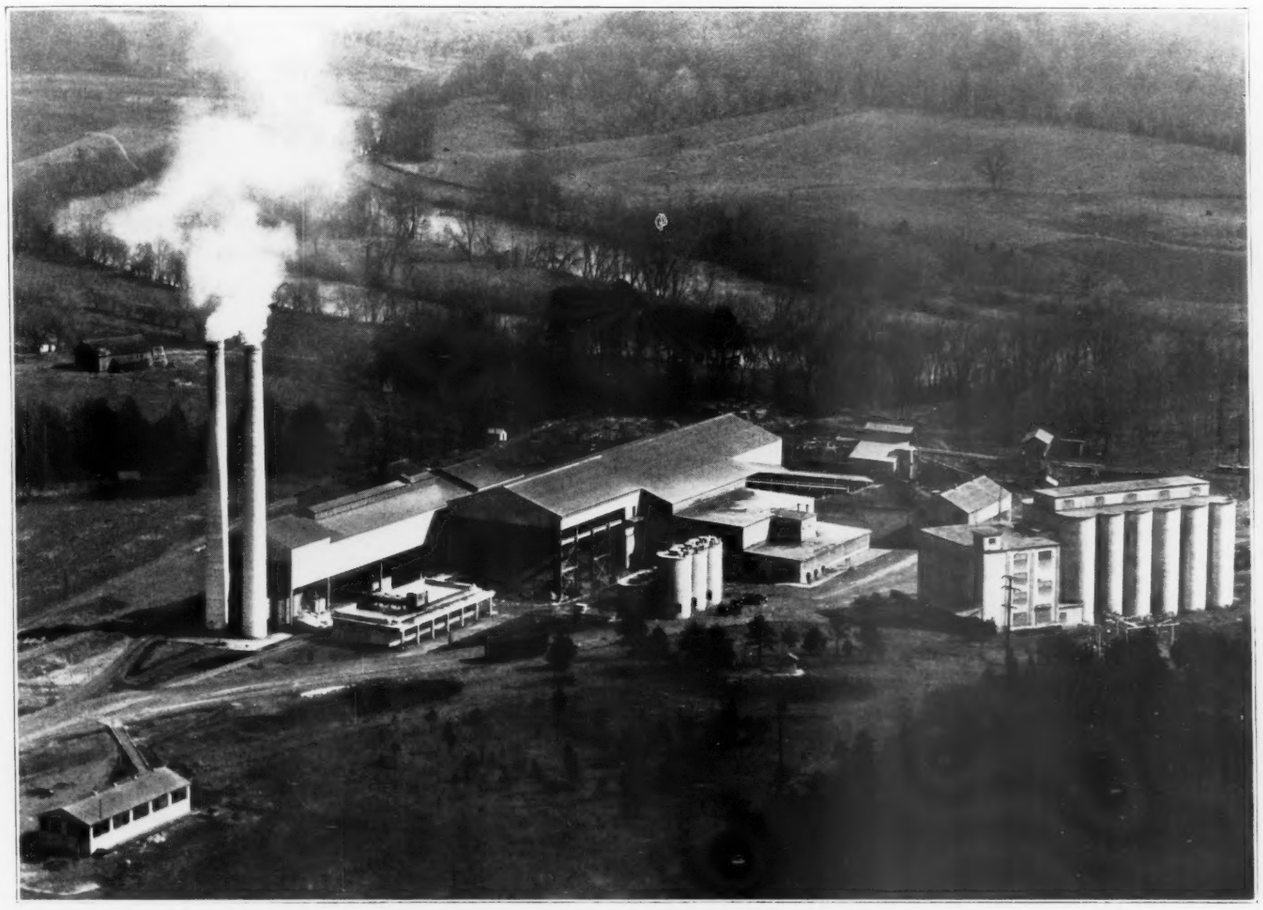
The open-storage building.

the bag elevator to deliver bags to the operators' floor, and is designed for future extension to contain bag cleaning, sorting and repairing equipment. A Norblo dust collector installed in the packhouse keeps the air unusually clean and makes the operation of the packing machines much more pleasant, which is so important in a plant located in a tropical country.

Oil from tank cars is delivered to underground reinforced-concrete storage by gravity. The storage capacity is sufficient for thirty days' supply. Oil is pumped to small storage tanks on the kiln

(Continued on page 62)

Volunteer Plant Favorably Located for Portland-Cement Manufacture



An airplane view of the Volunteer Portland Cement Co. plant.

All Raw Materials and Coal Are Found Within 120-Mile Radius of Operations

By MAT. F. BEISBER

POSSIBLY the two most impressive features of the Volunteer Portland Cement Co. mill are the thorough simplicity of its design, and the remarkable location upon which it is built. Bearing the mark of its designer, Major Frederick H. Lewis, the Volunteer plant stands to-day as one of the best examples of plant engineering, representing an operation unusually well located, built adequately to serve its own market, and designed to operate with a maximum efficiency obtainable from the best equipment.

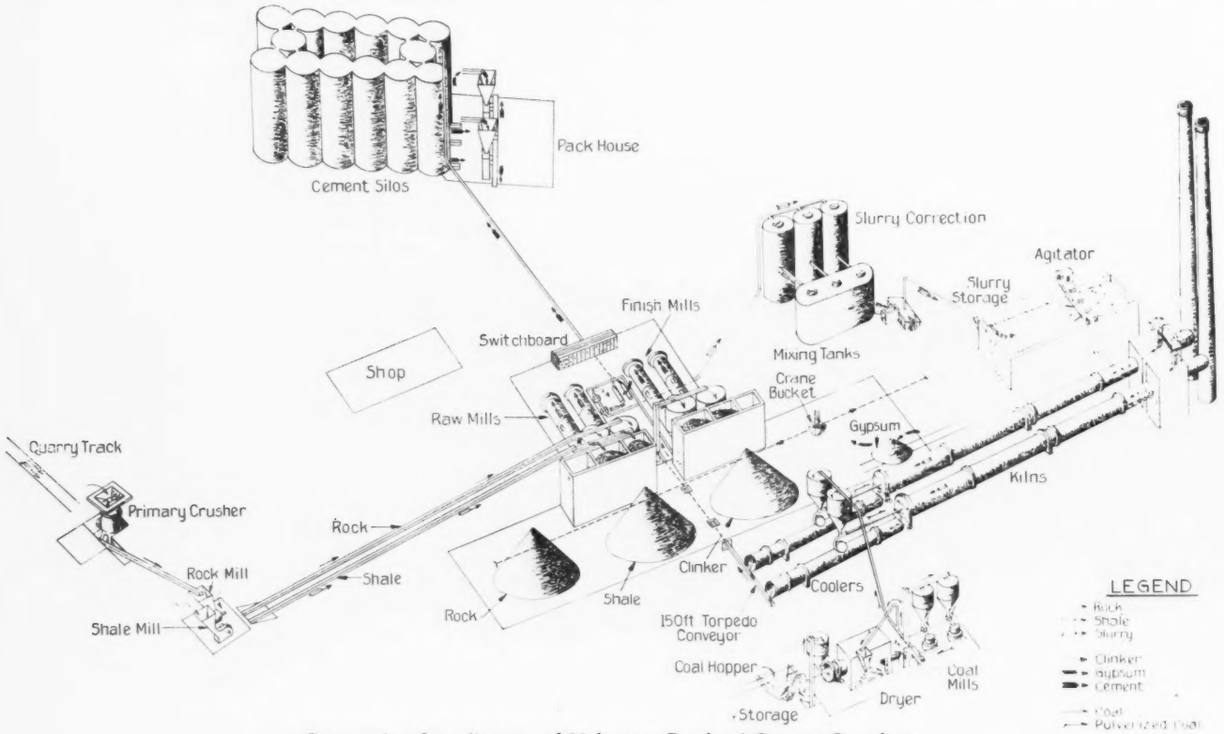
In size, the Volunteer plant is a 3,000-bbl. wet-process operation employing two kilns. Marble—quite suitable for the finest exterior uses because of its beautiful colors which vary from pink to gray—is its principal raw material. Being located within 6 miles of Knoxville, the company enjoys a fine local market as well as that of the eastern portion of Tennessee and neighboring states. Knoxville claims the Volunteer as its own—and justly so, for a good share of the capital stock is locally owned.

In designing the mill proper, Major Lewis sought to achieve a maximum of value per dollar expended. Being a director in the company his interests were more than purely commercial, and the results obtained attest to the wisdom of his methods. A list of the principal mechanical units selected for the various process operations reads like a roll call of the machinery manufacturers catering to the cement-mill trade, indicating the free hand the Major used to equip his plant with the best machinery obtainable.

Major Lewis has distinguished himself in the Portland-cement industry through his many contacts with both European and American plants since 1888. Some of the mills he has designed include the Alpha Portland Cement Co. plant at Martin's Creek, Pa., the Lehigh Portland Cement Co. plant at Fordwick, Va., and the Standard Portland Cement Co. plant at Leeds, Ala., now a division of the Universal Atlas Cement Co. of Chicago, Ill. He has also had charge of the rebuilding and enlarg-

ing of a number of plants from Alabama to Maine.

Construction work on the Volunteer plant began in June of 1927, under the direction of Major Lewis with the assistance of Major Charles F. Lewis, who is now manager of the plant, and Walter E. North, now engineer in charge of plant operation. Although a large force of the company's own men was employed in construction, machinery setting and electric wiring, several other firms shared in the work. The Burrell Engineering & Construction Co. built the stacks, slurry tanks, cement-storage silos and the pack house. Steel buildings were furnished by the Virginia Bridge & Iron Works and the Ingalls Iron Works. Miscellaneous concrete work for building and machinery foundations was let to the A. R. McMurray Contracting Co. The plant was completed in May, 1928, the first cement being made on May 15, 1928.



Perspective flow diagram of Volunteer Portland Cement Co. plant.

Not many cement plants enjoy as favorable a location for cement manufacture. With a choice of either limestone or marble—both entirely feasible for cement manufacture—shale in sufficient quantity within the quarry site, coal mines but 40 miles distant, and gypsum from mines but 120 miles away, the sources of raw materials left nothing to be desired. At its very doorstep is the John Sevier yard of the Southern Railway which, with its 10,000-car handling capacity, affords unusual facilities for the movement of all classes of freight. Being within the terminal zone of the city of Knoxville, additional facilities are available over the Louisville & Nashville R. R.

The stripped deposit. Note unusually eroded surface.

Hydraulicking the quarry overburden. Water added at left to aid the flowing sludge.

Of unusual interest from a geologic point of view is the Volunteer company's quarry. The actual site can be seen from a topographic map to consist of

two parallel ridges, named Bounds Ridge and Patillo-Weeden Ridge. A section crossing both ridges reveals the unusual distribution of the marble and limestone. The crest of the Patillo-Weeden Ridge is marked by a sandy limestone which underlies the area occupied by shale which is parallel to and immediately south of it. To the north of the crest of the Patillo-Weeden Ridge, the Holston marble occurs which is succeeded below and further northward by the Chicamauga limestone. This same limestone emerges on Bounds Ridge to the south where it is again in contact with the Holston marble. Thus it is evident that the Holston marble has been folded into a steep syncline or trough; the area between being occupied by shale. After extensive core-drilling all over the property it was decided to begin quarry operations in the Holston

Loading blasted marble into quarry cars.

marble deposit at a position between and westward of the two ridges. At present operations have progressed into Bounds Ridge and westward through the site of the old Evans quarry which was used many years ago as a dimension-stone quarry.

Some indication of the quality of the Holston marble can be obtained from the following report prepared by Edwin C. Eckel, mining geologist of Washington, D. C.:

"Holston marble is a fine-grade crystalline rock varying in color from light gray to pink. It is very uniform in composition, and suitable for use as a cement material throughout. The following analyses are representative:

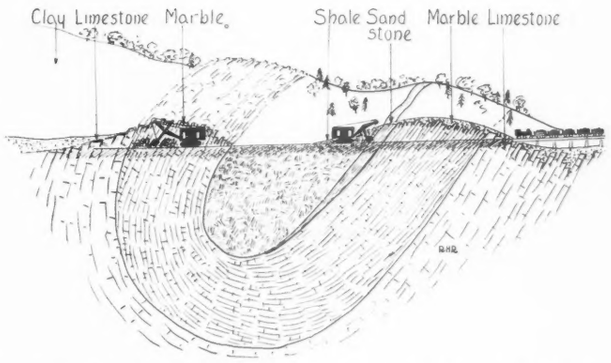
	A	B	C	D	E
Lime carbonate	94.68	96.50	97.97	98.22	95.17
Magnesium carbonate..	3.23	0.63	Tr.	0.21	1.16
Silica	1.52	1.28	1.15	0.93	
Iron oxide and alumina.	1.12	0.84	0.72	0.71	2.71

All of these samples indicate stone which will be entirely satisfactory for use in the manufacture of Portland cement of standard quality. The magnesia is well below the permissible limit and the silica, alumina and iron oxide are present in small and well balanced amounts."

Aside from the geologic interest in the deposit, the quarry is exceptional in that it is above the level of the mill proper. Its maximum height above the mill ground level is 80 ft. The quarry floor was placed at a level consistent with the water table established by the extremes of the Holston River, being about twenty feet below the level of the crusher equipment. Operations in the quarry and the shale bank are approximately 2,000 ft. and 2,500 ft. respectively from the crushing plant which permits the use of standard railway equipment for the transportation of all materials on a grade not exceeding two per cent. One track originating at

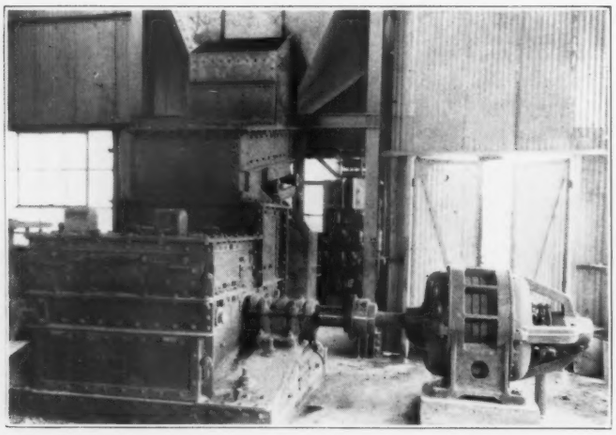
Loading shale into side-dump cars.

the quarry face extends through a saddle in the Patillo-Weeden Ridge direct to the crushing plant. A branch on the quarry floor extends to the shale bank, and another branch on the plant side connects with the company's service tracks. Thus a single-track system provides facility for both rock and shale, and actually permits the movement of freight into the quarry! To illustrate this unusual facility, nearby marble quarries ship waste marble blocks to the Volunteer plant for use as raw material for the mill. Flat cars of the waste marble are shipped to the company and are hauled direct to the quarry floor where a space is provided for this class of material.



Sketch of quarry with cross-section below grade and elevation above grade.

The quarry ledges which are now approximately 60 ft. high are stripped by hydraulicking because of the peculiar unevenness of the top surface of the deposit. So rough and rocky is this surface that it is exceedingly difficult to walk over it, and stripping by mechanical excavation is impossible. Accordingly a hydraulic gun is directed at the over-



The hammer-mill used as a secondary rock crusher.

burden which varies in thickness from zero to 15 ft. This material is then washed over the face to sumps in the quarry floor, thence pumped to a settling pool and the clear water allowed to drain into the Holston River. Two primary pumps in series, both of which are DeLaval units, supply the water to the guns. The first one is located at the river, drawing water at the rate of 2,000 g.p.m. and sending it on through a 10-in. pipe-line at a head of 200 ft. The second centrifugal pump is located near the crest of Bounds Ridge close to the hydraulicking operations. It receives the water from the 10-in. pipe-line adding to it another 347-ft. head and sending it to the hydraulicking gun at the rate of 800 g.p.m. The pressure at the gun is approximately 190 lb. per sq. in. The stripping operations are carried on continuously. The "mud" pump in the sump is of Georgia Iron Works manufacture.

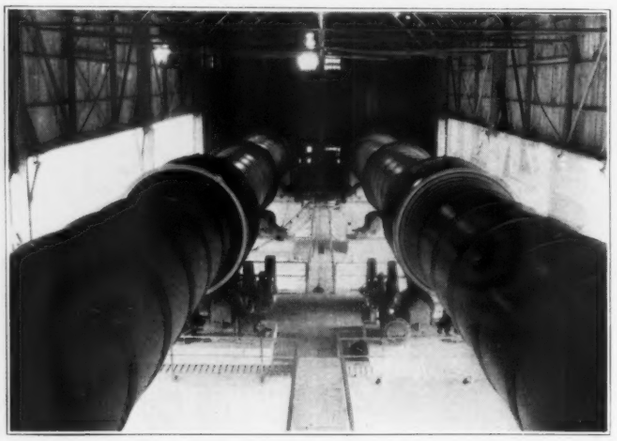
Because of the uneven character of the marble surface, the two Armstrong well-drill rigs require timber shoring for their movement along the ledge. These drill rigs average 2 ft. per hour drilling 6-in. holes on 10-ft. by 15-ft. centers. The holes are loaded with semi-gelatin explosive using any of the following brands: DuPont, Hercules, Atlas, Trojan or Union. Usually at least 25 holes are detonated in a single blast.

Two Bucyrus-Erie electric shovels handle the loading of the rock and shale. For loading the rock, a 2-cu.yd. shovel with Ward-Leonard control is used. There are a total of 12 Easton steel quarry cars in use, each having a capacity of 10 tons. A Whitcomb 25-ton locomotive powered by a LeRoi 6-cyl. gasoline engine hauls four of the loaded cars in a train to the crushing plant. Shale is loaded but four days per month, only a small quantity being required for the desired slurry mixture. A Bucyrus-Erie ¾-cu.yd. electric shovel loads this material into Western 8-ton capacity cars which are hauled by a Whitcomb 12-ton locomotive in trains of 2 cars each.

At the plant, the quarry cars arrive first at the primary crusher hopper. The same track is extended further to the shale-mill pan conveyor which is located in the secondary rock-crusher house. For primary crushing of the steam-shovel-size marble, an Allis-Chalmers McCully 36-in. gyratory crusher is employed, mounted in a pit to reduce the height of the crushing chamber. A steel structure overhead supports a timber-lined 20-ft. by 18-ft. rock box over the crusher spider and a crane. The latter is a Milwaukee Electric Crane & Hoist Co. 25-ton unit used for handling crusher parts. A single line from the drum, however, offers a higher speed facility for handling rock in the spider, with, of course, lower power. The crusher is powered by a 200-hp. induction motor and is set at 5-in. break-

The three slurry-correction tanks with blending tanks at left.

One of the two kilns with portable control station in foreground.



Looking down on the two 215-ft. rotary kilns from the feed end.

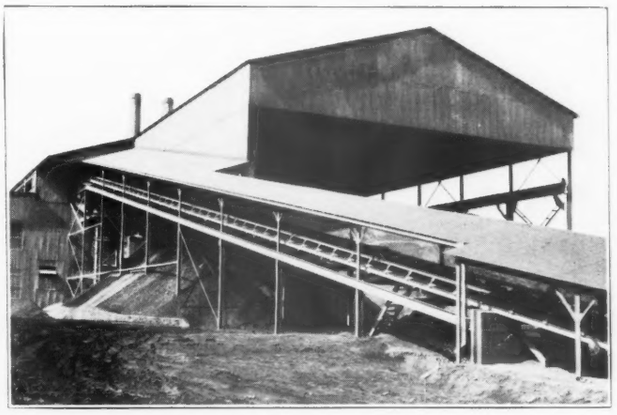
Panoramic view of the Volunteer plant with the cement-storage silos at left.

age. The crushed rock is fed to a 30-in. belt conveyor which sends it directly to a Pennsylvania SXT-11 hammermill crusher located in the secondary-crusher house. The hammermill is driven by a 250-hp. induction motor, and its feeder by a 10-hp. motor through a DeLaval speed reducer. In the same building the shale is received and crushed through another Pennsylvania hammermill. The shale is received on a traveling grizzly consisting of an endless chain of rolls 15 ft. on pulley centers. A set of stationary bars perpendicular to those on the chain permit the shale passing openings of 3 in. by 4 in. in size to fall below to the shale storage conveyor. Oversize pieces are carried into the hammermill which is a Pennsylvania "Sparton 50" unit driven by a 100-hp. motor.

Both hammermills discharge to conveyors which transport the materials to points of disposal in the

The cement pack-house.

plant as required. The rock conveyor has a 24-in. belt and is driven by a 20-hp. motor. It discharges to a second conveyor which sends the rock into either of the steel hoppers in the mill building. On the other side of the wall which separates the mill building from the storage shed, three concrete bins are located, two of which act as shale-feeder bins, being filled directly from the shale conveyor. The third concrete bin acts as a service bin. When the rock hoppers in the mill building are filled, the rock conveyor discharges into the service bin from which the overhead crane rehandles the material to storage piles. When the rock hoppers are empty, the crane rehandles the rock from storage to the serv-

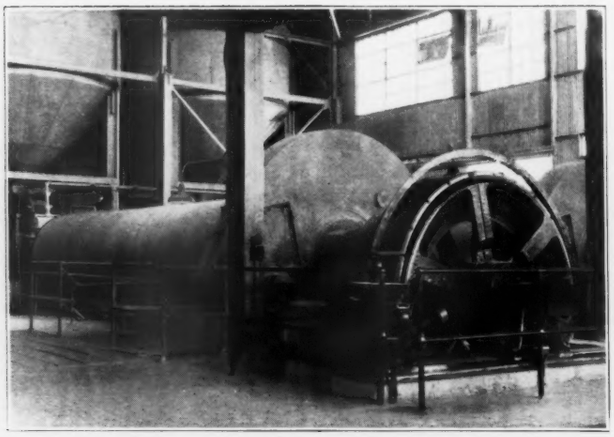


The rock and shale conveyors.

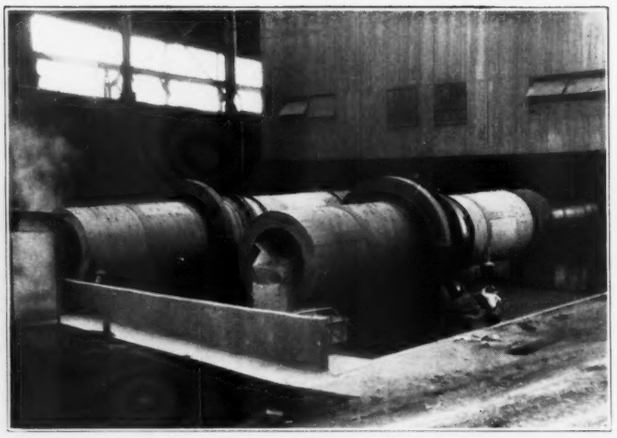
ice bin, which, in turn, feeds an elevator to get the material back to the rock conveyor above the mill hoppers. All elevators were furnished by the Chain Belt Co.; conveyors by the L. G. Stearns Co.

All surplus raw materials including gypsum, and the clinker, are stored in the open-storage shed. A Milwaukee Electric Crane & Hoist Co. traveling crane equipped with a clam-shell bucket handles the materials in storage as required. The gypsum is brought to the storage shed in box cars, dumped on the ground and rehandled by the crane.

Both the raw-grinding and finish-grinding mills are located in one building, there being two of the former and two of the latter. The two raw-grinding mills were built by F. L. Smidth & Co. and are each 7 ft. in diameter and 39 ft. long, with a rated capacity of 80 bbl. per hour each. They are of the three-compartment-and-screen type known as the



Raw-grinding mills with their drive motors at right.



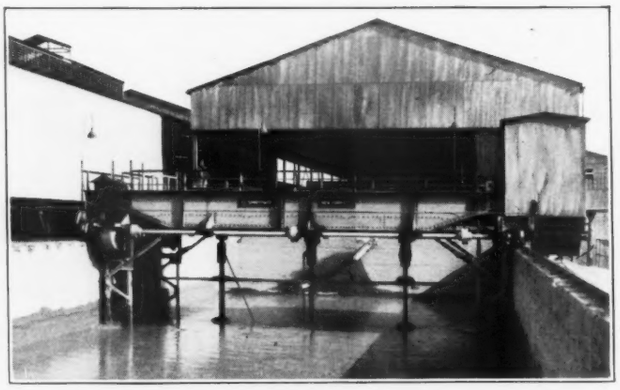
The two clinker coolers discharging to torpedo conveyor.

"Unidan" and are each driven by 600-hp. super-synchronous motors at a speed of 20 r.p.m. through Bethlehem Foundry & Machine Co. flexible couplings and spur-gear reductions. Each mill carries three sizes of grinding balls with a load of 50 tons per mill.

Returning to the steel rock hoppers, each of these tanks stores 150 tons of rock. Both the rock and shale are fed into the mills by Shaeffer poidometers which, in turn, discharge to American Miag torpedo conveyors to send the materials into the mills. The system employed in feeding the mills will be described with the finish-grinding process.

From the raw-grinding mills the slurry is spouted to a set of duplex Wilfley 4-in. slurry pumps located in a basement tunnel which connects the mill house with the kiln house. This tunnel also serves other purposes which will be taken up later. Both Wilfley pumps are driven by 40-hp. motors; but one is used, however, the other acting as a standby.

From the pumps, the slurry is sent to three correction tanks, then to a blending tank following which it is pumped to a slurry-storage tank. The three correction tanks are built above the level of the blending tank, and the manner in which they were constructed is of interest. They were designed by the Burrell Engineering & Construction Co. of Chicago upon the suggestions of Major Lewis. Each tank consists of a circular silo-shaped structure divided into two portions, the upper storing the slurry, the lower part being the foundation; the latter are used for storerooms, and one of the three tanks has an office in the lower portion. Under ordinary sliding-form methods of construction there would be a tendency for leakage to occur around the joint line of the ceiling and the circular wall making it impossible to store anything in the lower portion. To prevent this, a special form was built for the tank floor so that when the circular wall form was in position, both the floor and the immediate wall section above it were poured in one piece. Then the circular wall was continued upward to completion. Thus the floor and the wall of the correction tank merely rest on a circular foundation. Each slurry tank has a capacity of 600 bbl. Vertical-shaft agitators driven from a 20-hp. motor are installed in each tank. The blending tank located below the correction tanks has a capacity of 1,800 bbl., and is likewise equipped with agitators. Hourly tests are made of the slurry contained in the three correcting tanks, and the correct proportion is made up in the blending tank. Adjacent to this tank in a pit is another pair of Wilfley pumps which pump the slurry to a storage-agitation tank. The latter was also designed by the Burrell company. This tank is of concrete construction, 35 ft. by 100 ft. with a capacity of 7,500 bbl. An F. L. Smidth traveling agitator auto-



The slurry-storage basin with its traveling agitator.

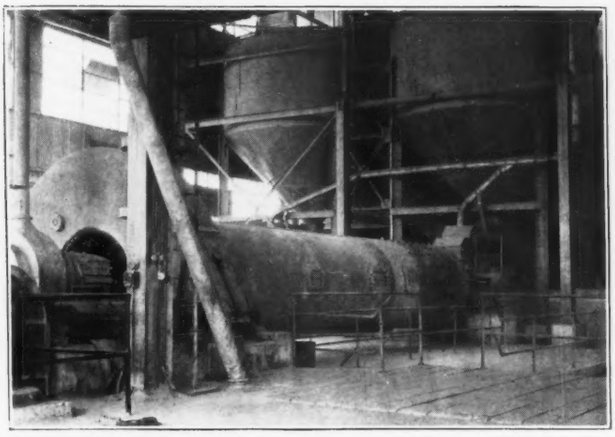
The primary-crusher building. Note overhead crane.

matically reverses itself back and forth in this tank, preventing segregation through the action of mechanically-driven paddles and air jets.

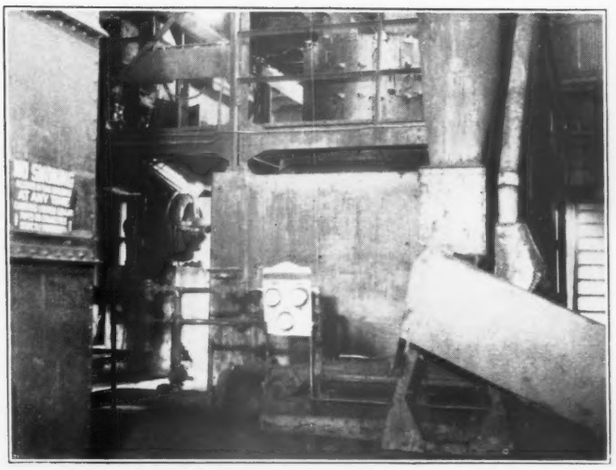
From the storage basin, the slurry is again handled through a set of duplex Wilfley pumps to the ferris-wheel feeders above the kilns. Each ferris wheel has 8 buckets and rotates at a speed of 7 r.p.m., the discharge being spouted direct to the kiln. Three-horsepower direct-current motors are used on the ferris wheels, with a speed variation of from 500 to 1,000 r.p.m.

Kilns and Coolers

The two kilns for the Volunteer plant were built by the Vulcan Iron Works. They are 10 ft. in diameter and 215 ft. long, and rotate at a speed of 1 r.p.m. Each unit is driven by a 50-hp. motor through a Link-Belt speed reducer and 4 spur-gear reductions. Actual tests show a load of but 25 hp. per kiln when they are in operation under load. Pulverized coal is fed from overhead hoppers by Bailey feeders and is blown into the kilns by means of American Blower Co. blowers. The latter produce 7,000 cu.ft. of air per minute each and are driven by 20-hp. motors. This equipment is operated by direct-current equipment under speed control similar to the ferris wheels. The Burrell company took a contract for the two 175-ft. concrete stacks which serve the kilns. These were built by the Weber Chimney Co. for Burrell and are of Weber design.



The 3-compartment finish-grinding mills.

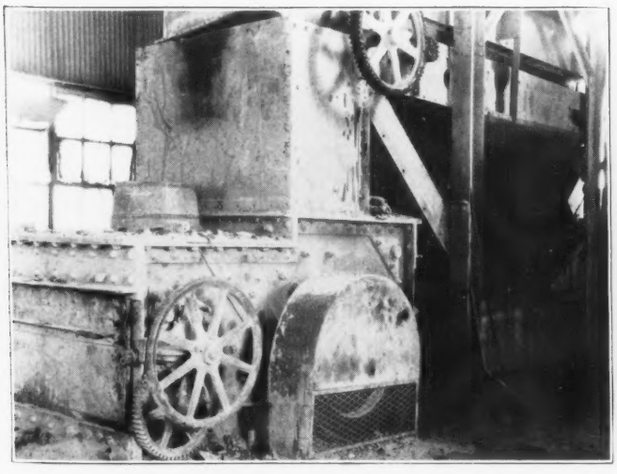


View of coal mill showing pumps and pulverizers.

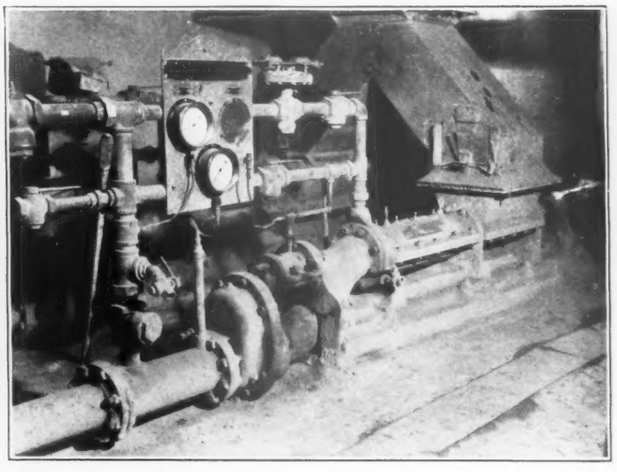
As the clinker leaves the kilns it is passed directly into rotary coolers, one for each kiln. They are of the American Miag type built by the Traylor Engineering & Mfg. Co. Each cooler has a capacity equivalent to that of the kiln it serves—1,500 bbl. per day—and is driven by a 30-hp. motor through a Traylor speed reducer.

Should the clinker coolers or the conveying equipment which follows become disabled an emergency drag chain located on a line between the kilns and coolers can be pressed into service. This emergency equipment consists merely of a 12-in. chain discharging into an elevator which, in turn, discharges to the clinker-storage pile in the storage building. A single 10-hp. motor operates this equipment.

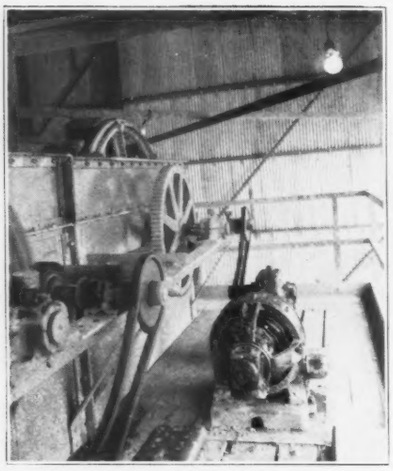
Both coolers discharge to an American Miag 150-ft. torpedo conveyor extending through the tunnel below the storage building. An elevator then receives the clinker and sends it up to another torpedo conveyor which, in turn, relays it to the finish-grinding mill hoppers in the mill room. Both torpedo conveyors are actuated by a flywheel crank-



The shale mill with traveling grizzly in background.



Pneumatic pumps which deliver cement to storage silos.



Top.—Stockpile of waste marble from neighboring quarries.

Left.—Ferris-wheel kiln feeder.

Right.—Coal elevator and crusher.

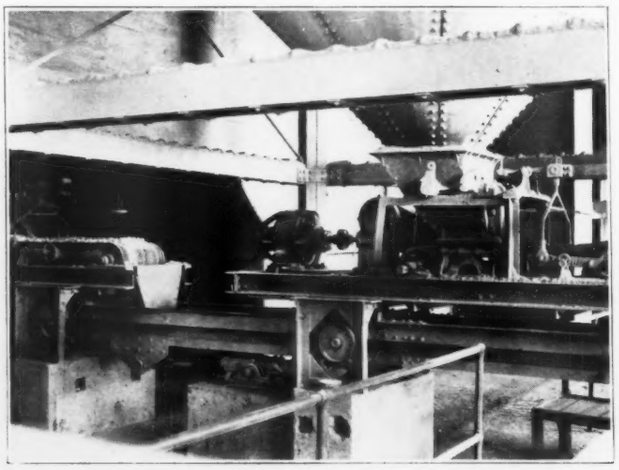
mechanism with a 9-in. reciprocating motion at the rate of 52 strokes per minute. The first torpedo conveyor is driven by a 10-hp. motor through a DeLaval speed reducer, the bucket elevator (8-in. by 16-in. buckets) by a 20-hp. motor, and the second torpedo conveyor by a 5-hp. motor. Surplus clinker from the steel storage tanks in the mill building is by-passed into storage.

The tunnel previously described serves as a general utility channel between the mill building, storage shed, and the kiln building. Slurry piping, clinker-conveying equipment, power lines, water-piping and other utility service are carried through this means of connection between the different divisions of the plant.

Two F. L. Smidth & Co. Unidan 3-compartment-and-screen grinding mills located in the grinding-mill building handle the finish grinding of the clinker. These mills are similar in size and drive to the raw-grinding mills. Each mill is fed by means of an American Miag torpedo conveyor over which two Shaeffer poidometers are mounted. In the case of the raw-grinding mills, the poidometers handle shale and rock; for the finish-grinding mills, gypsum and clinker. The poidometers are driven by direct current motors, the set for each mill being controlled for quantity proportion according to the chemist's specification. The rate of flow of each of the combined units is readily controlled by a rheostat.

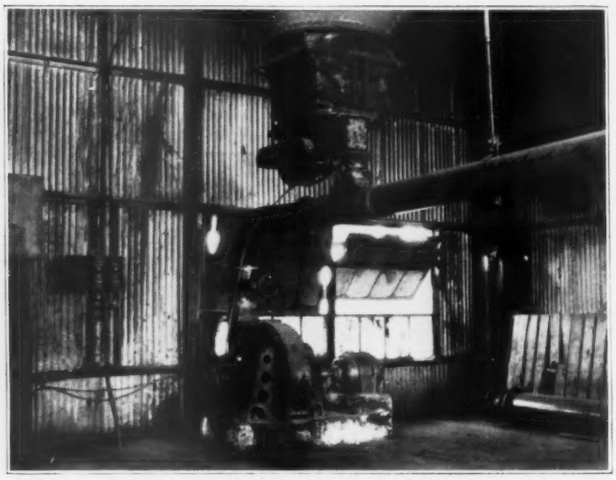
A 44-ft., 16-in. screw conveyor delivers the finished cement from the grinding mills to a duplex set of Fuller-Kinyon pumps located in the basement of the mill building. These pumps, each driven by a 75-hp. motor, send the cement over to the pack house for storage or packing.

The Burrell Engineering & Construction Co. also designed the storage silos and the pack-house. There are fourteen silos in the group, two rows of six and a center row of two silos. All are 60 ft. high, the center ones being 20 ft. in diameter, and the exterior ones 21 ft. in diameter. Between the center



Proportioning equipment over torpedo conveyor which feeds grinding mills.

silos an open space is utilized for additional storage of 20,500 bbl. The total bin storage aggregates 97,000 bbl. Three Link-Belt screw conveyors withdraw cement from any desired silo in the three rows; two screw conveyors collect the cement from the first three, delivering it to an elevator. The latter sends the cement over a screen to remove any possible undesirable material. From this point the cement is sent to bagging machines. There are two 3-spout Bates bagging machines; beneath them a 30-in. loading belt carries the bags out to the cars for loading. In addition to this equipment there is also a Western Valve Bag Co. sack-tying ma-

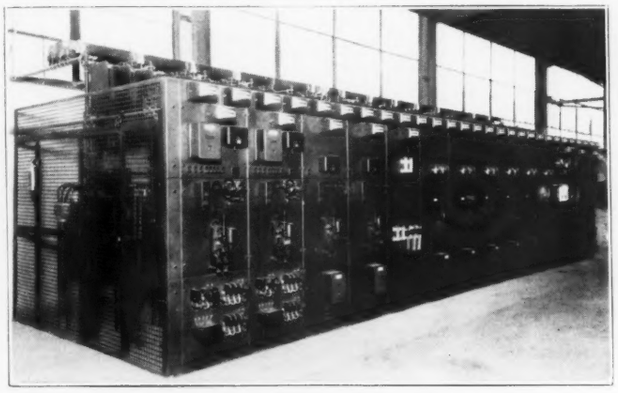


Pulverized-coal feeder in kiln building.

chine, and a drum-type cleaner for cement sacks.

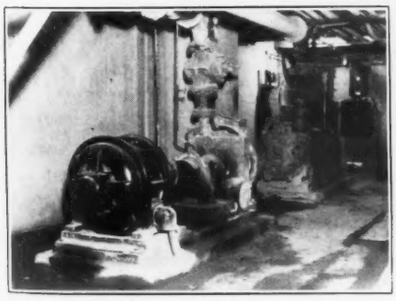
To the north of the kiln house a coal-storage pile is provided, and adjacent to it the coal-pulverizing mill. Cars of coal are brought to the mill site on a specially-built fill provided with a track hopper. A conveyor delivers the coal to a Jeffrey 24-in. single-roll crusher from which it is either sent out to a storage pile or to a hopper in the mill. A single 20-hp. motor powers the conveyor and the crusher. For handling the stock-piled coal a Sauerman ½-cu.yd. Crescent scraper, operated by a 2-drum 15-hp. hoist, is used.

Within the mill, the first hopper feeds an elevator which, in turn, delivers the crushed coal to the coal-drier hopper. The elevator is driven by a 10-hp. motor. A Fuller-Lehigh drag feeder sends the coal into the Fuller-Lehigh drier where it is dried; another elevator sends it to hoppers over the Fuller-Lehigh pulverizers. Here the coal is reduced to the desired fineness and sent to Fuller-Kinyon pumps which, in turn, send it to the hoppers in the kiln house. The drier is fired with pulverized coal which is fed by a Fuller-Lehigh screw feeder.

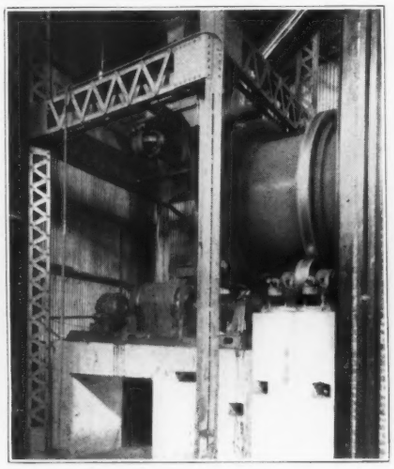


The 14-panel switchboard in the mill room which is the power-distribution center for the entire plant.

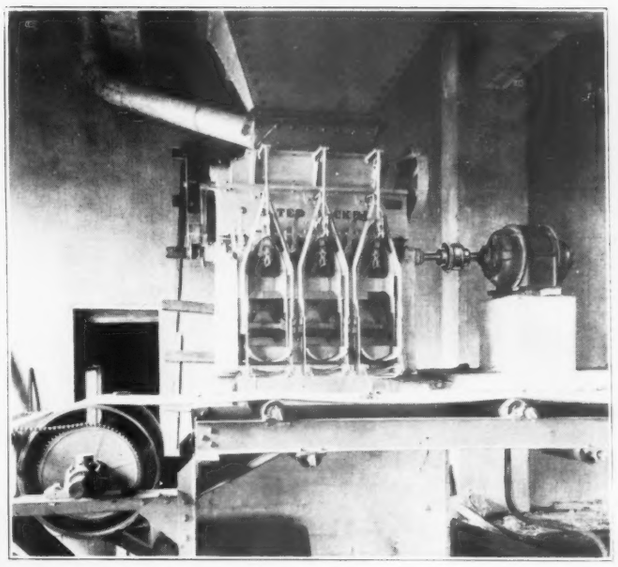
The drier is 5 ft. 6 in. in diameter and 42 ft. long, rotating at a speed of 18 r.p.m. It is driven by a 20-hp. motor through a Jones speed reducer. The Fuller mills are 48-in. units, each having a capacity of 4½ tons per hour, and are driven by 125-hp. motors direct connected through Falk flexible couplings. The coal mill was furnished practically in its entirety by the Fuller Lehigh Co.



Two of the slurry pumps in the mill-building tunnel.



Speed-reducer drive of rotary coal drier. Feeder above.

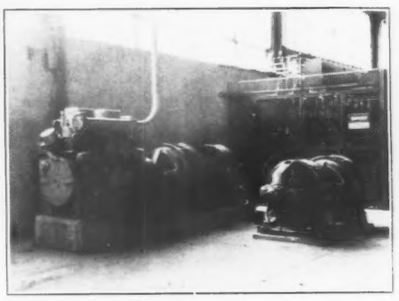


One of the two 3-spout bag packers.

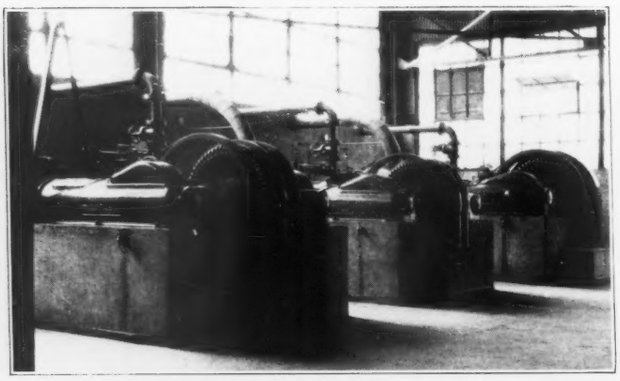
Dust is eliminated at its source wherever possible in the plant. In the coal mill just described, all elevators and conveyors are equipped with vent stacks, and the drier is equipped with an exhaust fan and a cyclone collector for the removal of dust. In the grinding mill, the finish mills are equipped with Northern Blower Co. exhaust fans and dust filters.

The auxiliary equipment of the Volunteer plant is principally in the grinding mill and in the shop. In the grinding mill are located the three air compressors and the gasoline-engine-driven generator set. The latter supplies sufficient power to the kiln motors so that in the event of a power failure the kilns will be protected from serious damage. The compressors are Ingersoll-Rand cross-compound units each having its own motor built in the unit. There are two No. 9¼ Ingersoll-Rand compressors each driven by 125-hp. motors, and a No. 11 compressor driven by a 175-hp. motor. Compressed air is used all over the plant for the cement pumps, slurry agitation, pulverized-coal pumps, air hammer and other equipment.

The company's shop is adequately equipped with general machine tools, lathes and the like. There is also a Nazel Eng. Co. air hammer, and a General Electric welding outfit.



Gasoline-engine-driven generator set for standby service.



The three compressors in the grinding mill which supply air for all purposes.

Knoxville has an unusually good electric power supply, there being no less than five power companies in its immediate hook-up. This, with the fact that power in this district can be purchased as cheap or cheaper than anywhere else in the east, is a distinct asset to the Volunteer company to the extent that it would be unprofitable for it to produce its power wholly or in part. The Tennessee Public Service Corp. furnishes power at 2,300 volts to the company from its substation located near the pack house. From this point the circuit is divided for each department of the plant, each tap being protected by its own circuit breaker. Each department has its own 2,300/400-volt transformer. All motors above 50 hp. are wound for 2,300 volts and those below 50 hp. are wound for 440 volts. Two motor-generator sets provide direct current for synchronous motors and other direct-current motors in the kiln and grinding-mill departments. All motors below 50 hp. are thrown "across the line" in starting and in most installations, push-button-type controllers are used for starting all motors. The General Electric Co. furnished all motors, transformers, control apparatus and other miscellaneous electrical equipment throughout the plant.

J. Ross Hanahan is president of the Volunteer Portland Cement Co. Mr. Hanahan is a prominent southern industrialist being at the head of a number of other companies including the Planters Fertilizer & Phosphate Co., and the Carolina Portland Cement Co. Howell J. Davis is vice-president. Mr. Davis is a prominent Knoxville business man and banker. E. Earle Evans is secretary-treasurer. As stated, Major Charles F. Lewis is plant manager, and is the son of Major Frederick H. Lewis, the designer of the plant. Other plant men of interest are C. S. Branscomb, chemist, J. H. Pugh, maintenance supt., C. A. Moser, mill supt., and J. S. Pugh, quarry supt.

Erects Plant at Mexico City

(Continued from page 52)

building burning floor, and delivered to the kiln by a pump at 40 lb. per square inch pressure. This oil is atomized by air supplied by a blower of English make.

Kiln gases are drawn through the driers, as previously described, by a suction fan and forced through the Cottrell precipitator to eliminate any dust nuisance. Precipitated dust is reclaimed from the Cottrell building by means of screw conveyors and Fuller-Kinyon pump and fed back to the raw mill.

Individual buildings have been designed and constructed for the plant office, the laboratory and the

The crusher building where raw material is received.

welfare and locker room. Each of these buildings is of reinforced concrete with plastered-tile partition walls.

Power is 3-phase, 50 cycle and 6300 volts which is transformed to 440 volts. Speed reducers were supplied by the Falk Corp., and the elevating and conveying machinery was manufactured by H. W. Caldwell & Son Co. and shipped to Mexico City.

G. H. E. Vivian, whose ideas were largely responsible for the design of the plant, is resident general manager of La Tolteca Compania de Cemento Portland, and A. B. Stewart, under whose direction construction is being carried on, will be general superintendent of the new plant, as well as of the old plant at Tolteca which will be kept in operation.

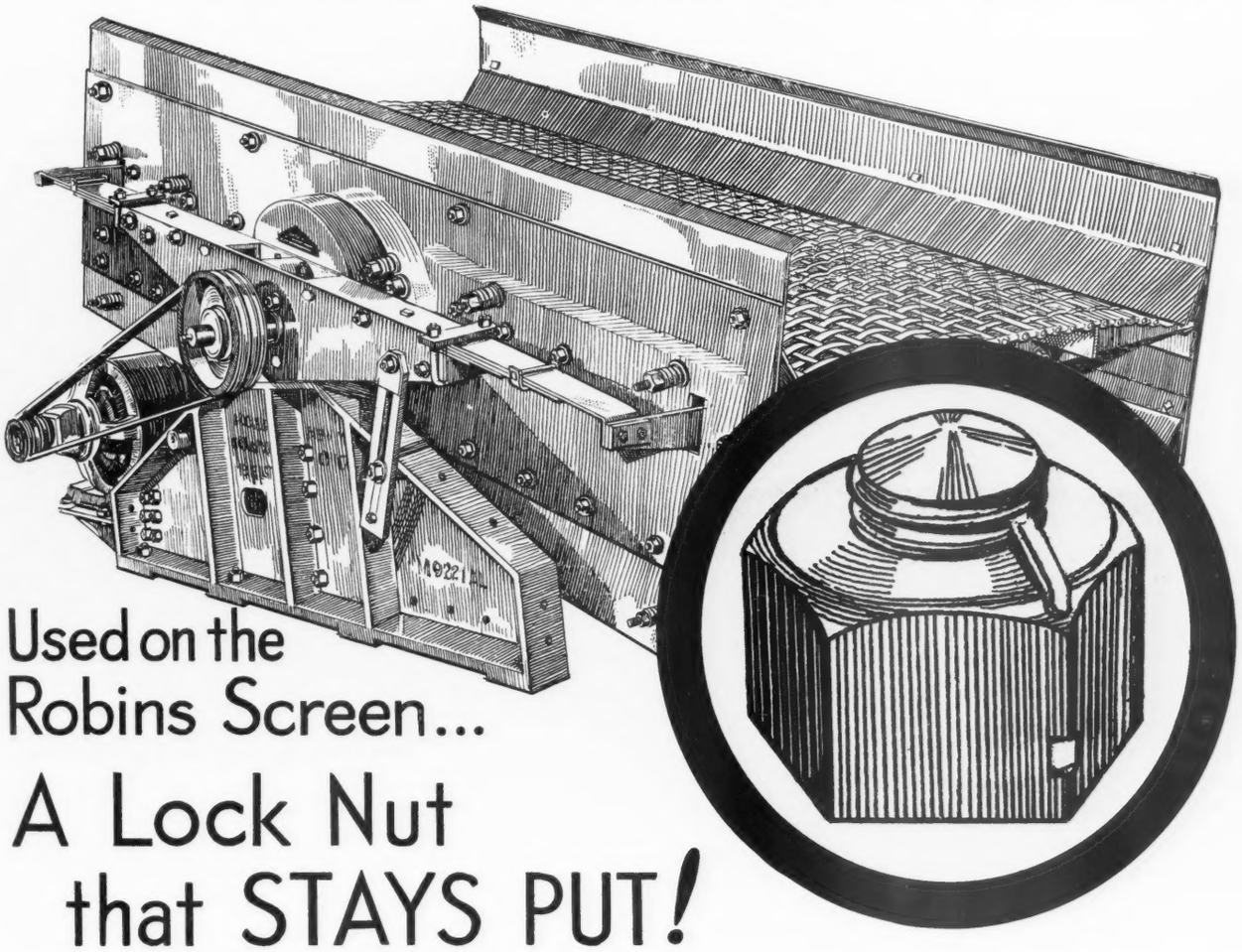
Complete plans and specifications were prepared, and supervision of the construction was handled by the Chicago office of Macdonald Engineering Co. under the direction of M. E. Crosby, chief engineer.

A Correction

The June 3, 1931, issue of PIT & QUARRY carried an article describing the operations at the ready-mixed-concrete plant of the Sloss-Sheffield Steel & Iron Co. at Birmingham, Ala. Magnetic clutches, employed on the lineshaft which drives the cement screw conveyor, were referred to as of Cutler-Hammer manufacture. This was an error. The clutches, four in all, were manufactured and supplied by the Magnetic Manufacturing Co. of Milwaukee, Wis.

The Magnetic Manufacturing Co. has supplied this plant exclusively with all magnetic equipment in the past. This equipment includes magnetic separators for tramp-iron separation as well as the magnetic clutches for transmission service.

The General Automatic Lock Nut



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NATURALLY, a vibrating screen affords an excellent opportunity for nuts to work loose and fall off, with disastrous results. That's why, after thorough investigation, the Robins Conveying Belt Co. installed General Automatic Lock Nuts on the screen pictured above.

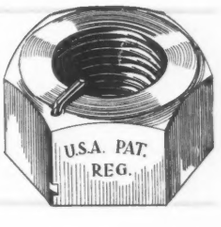
Because *they cannot work loose.*

The General Automatic Lock Nut is a single unit and requires no washer. It is applied with a wrench like an ordinary nut. The locking pin engages the thread of the bolt and locks the nut *tight*. The nut may be removed *with a wrench,* without injury to nut, locking pin on bolt.

Let us send you samples. Try them . . . and you, too, will adopt the General Automatic Lock Nut as standard equipment.

GENERAL AUTOMATIC LOCK NUT CORPORATION

General Motors Bldg. New York, N.Y.



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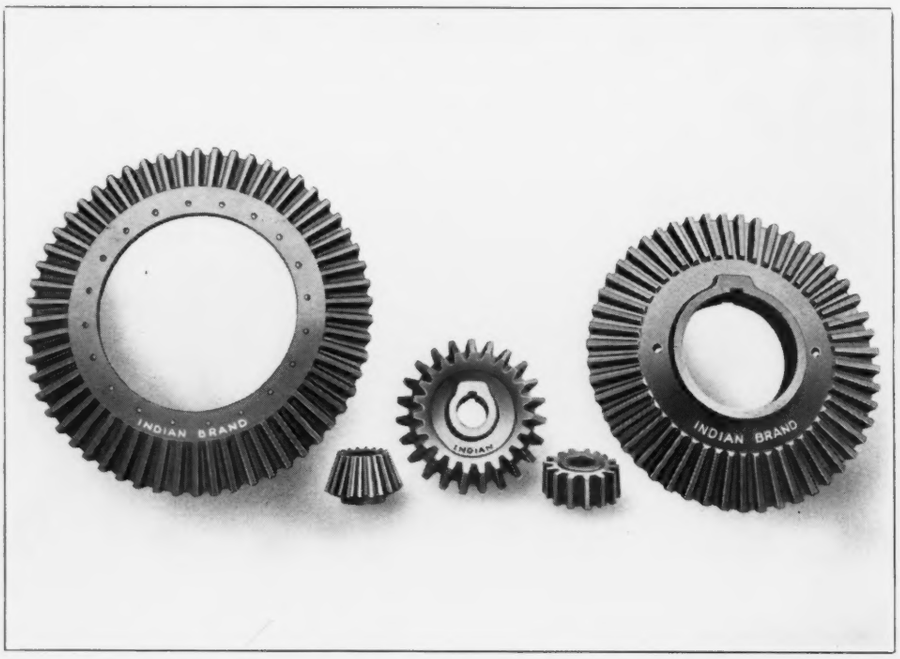

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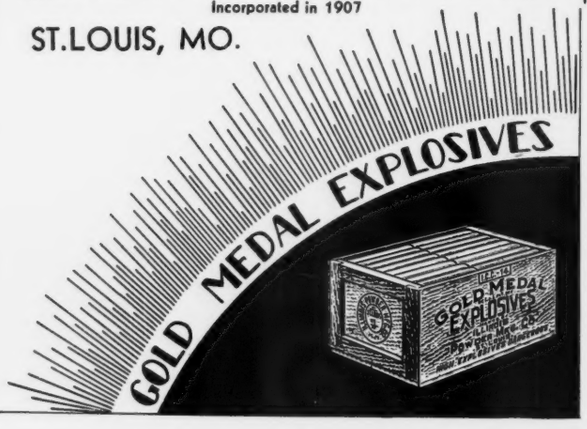

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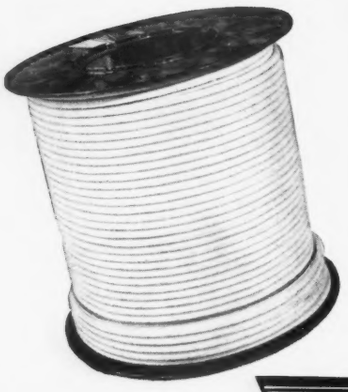

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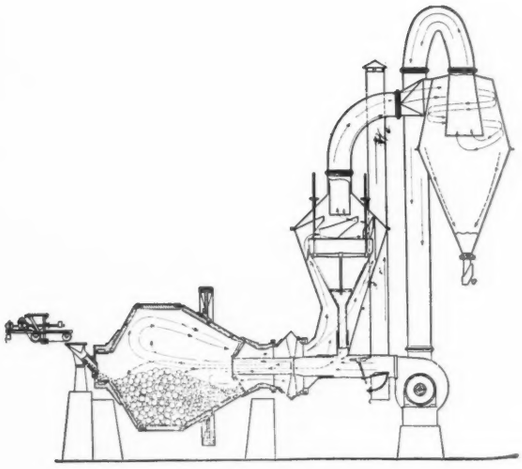

The Hardinge Mill at Security Has Made Good!

One 10-ft. Hardinge Mill equipped with the Reverse Current Air Classifier was recently installed at the Security Plant of the North American Cement Co. (Hagerstown, Md.) to grind Limestone.

Not only has the mill met every specification as to power, fineness, capacity, etc., but it has exceeded the recommendations made at the time it was ordered.

The cost of producing cement will be lowered at this plant, a vitally important factor, now that cement prices are so low.

We say without hesitation that our method of grinding is by far the cheapest of any yet developed. Facts are available to support this statement. Write for them.

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It's the extra capacity and cleaner tailings

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RAYMOND MECHANICAL AIR SEPARATORS are doing a great job in the cement industry—improving methods, introducing economies and increasing profits.

In scores of plants, it has been shown that cement raw material can be handled better and cheaper with *Raymond Separators* in closed circuit grinding, than with pulverizing mills alone in open circuit grinding.

One concern installed six *Raymond* 18-foot diameter Separators, which are now averaging better than 40 tons per hour from each unit—an increase of 35% over the former output. The separators take the grind of the mills at a fineness of 69% through 200-mesh, and deliver a uniform finished product, testing 92% through 200-mesh. Production costs are greatly reduced.

RAYMOND Mechanical Air SEPARATOR

Built in NINE Sizes.

The Raymond is the only center-feed, centrifugal type of Separator that is built with the patented revolving "whizzers" for rapidly expelling oversize particles from the air current. A *Raymond Separator,* equipped with the whizzer arrangement, will produce considerably more tonnage than one without it, besides recovering a larger percentage of fines.

Write for Bulletin

This describes the advanced features of design that have made the Raymond Separator so popular in the cement industry.

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Increased Duty on Foreign Cement Urged at Tariff Commission Hearing

Attorneys for Domestic Producers Given Thirty Days to Prepare and File Brief

PORTLAND-CEMENT producers of the United States requested the United States Tariff Commission to recommend to the President an increase in duty on imported cement from 23 cents a barrel to 36 cents a barrel during hearings before the Commission June 10 and 11.

The domestic interests' contention is that this change is necessary to equalize the trade activities and allow them to compete with foreign cement shipped into this country.

The request came as the windup to the domestic producers' submission of evidence at a hearing called by the Tariff Commission to inquire into differences in production costs in domestic and foreign mills in response to a Senate resolution of June 18, 1930, ordering the investigation.

Albert Mac C. Barnes, of the law firm of Barnes, Richardson & Halstead, New York, representing the domestic manufacturers, introduced such a mass of tables of figures and other compilations bearing upon his witnesses' testimony during the hearing, which lasted two days, that he asked for and was granted 30 days in which to prepare and file a brief.

Dr. Kemper Simpson of Brooklyn, N. Y., representing the importers and Belgian producers, summed up for his clients in a very few words. The importers' contention is that this is a case where the cost equalization theory breaks down utterly, as a basis for figuring tariff rates. He concluded by suggesting that the Commission recommend a "substantial reduction" in the existing duty.

While the commission is awaiting the submission of Mr. Barnes' brief for the domestic manufacturers, its representatives, who are conducting an investigation of mill costs here and abroad will continue with their work.

Witnesses heard for the importers were: Emmett J. McCormack, vice president of Moore & McCormack, Inc., and the American Scantic Line, Inc.; L. P. E. Giffroy, New Orleans, La., sales representative in the United States for the Cimentories Brigueteriel Riunis, a Belgian cooperative exporting organization; W. T. Miller, Boston, Mass., of Jenney & Lux, Inc.; E. R. Hollander, New York, of the Ferrocrete Import Co., Inc., an agent concern acting on a commission basis for distribution of a British manufactured product, and W. M. Richardson, Philadelphia, Pa., president of the Philadelphia Export Co.

Mr. Richardson, in his statement to the Commission, declared that the present duty on cement, formerly a duty-free commodity, which now is approximately 6 cents per hundred pounds, virtually has ruined importers. Speaking as an importer, he said: "We are wrecked; we're out of it. We can't compete now with the American product."

The other witnesses for the importers did not go quite so far in their statements, but all agreed that the 1930 tariff act establishing the duty on imported cement had decreased their business decidedly.

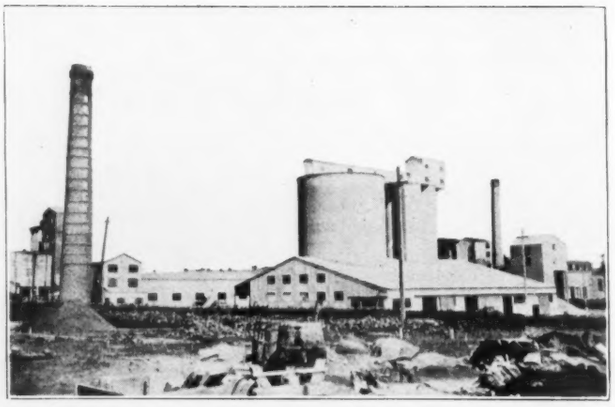
J. B. Colburn, also of the law firm of Barnes, Richardson & Halstead, assisted Mr. Barnes in the presentation of the domestic manufacturers' case. Among the witnesses they called were: Anthony Joureguy, an accountant, to testify to weighted average cost at all seaboard districts of producing standard cement, and to identify other exhibited compilations; F. N. Coogan, vice-president of the Alpha Portland Cement Co.; James H. Ackerman, vice-president of the Lawrence Portland Cement Co.; Charles F. Conn, vice-president of the Giant Portland Cement Co., Philadelphia, Pa.; Jas. C. Bradshaw, president of the James C. Goff Co., building materials, Providence, R. I.; Jno. C. Bowen, vice-president of the Lehigh Valley Portland Cement Co.; J. W. Johnston, vice-president of the Lone Star Cement Co. Alabama, Birmingham, Ala.; L. R. Ferguson, vice-president of the Lone Star Cement Co. Texas, Dallas, Texas; T. K. Partridge, vice-president of the Southwestern Portland Cement Co., Los Angeles, Cal., and M. A. Koffman, secretary of the same organization, Los Angeles.

In closing his case for the domestic interests, Mr. Barnes declared that his clients do not complain against the volume of import; that what they do object to is letting it in at such a rate of duty as now obtains. "It is not healthful to let these imported cements in at such a low figure as force the domestic manufacturers to lose in their efforts to compete with the foreign commodity," Mr. Barnes said. It was at this point that he asked leave for time in which to prepare his briefs, and appealed to the Commission to recommend an increase of from 23 to 36 cents a barrel in duty.

The two-day hearing brought out a mass of contentions from both sides to the controversy over the duty. L. P. Giffroy testified that the capitalization cost per barrel of cement in Belgium, or in other words the capitalization of mills divided by productive capacity, is $1.70 while in the larger mills in the United States this cost ranges from $2.10 to $2.50. He said the imputed interest charged per barrel of cement was from 6 to 9 cents in Belgium while in the United States the same item runs about 19 cents. The reason, he gave, was that in Belgium there is lower capitalization upon which interest is charged. Admitting Belgian interests are consciously attempting to extend their export trade,

(Continued on page 74)

Plant view showing the coal-grinding and drying buildings at the right.



Another view showing the slurry tanks, kiln house and cement silos.

Modern Cement-Mill Practice Reflected in Design of English Plant

Limestone Dumps Centuries Old Provide Raw Material as Production Is Started

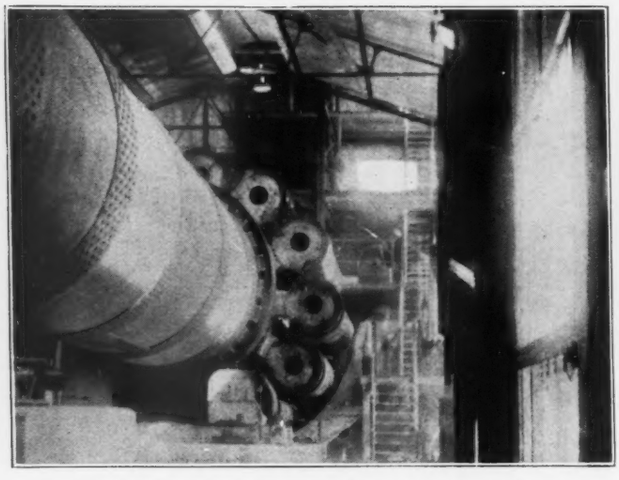
ON the main road to Leicester, England, about three miles west of the old-world town of Stamford, amid scenes of rural beauty, lies the famous Ketton estate where freestone has been quarried since the Middle Ages, the stone being used in the erection of many historic churches and buildings during the last 800 years.

Here was erected, in less than twelve months, the best-equipped modern cement plant in Europe, wherein the latest types of equipment and the finest raw material combine to produce the highest class Portland cement.

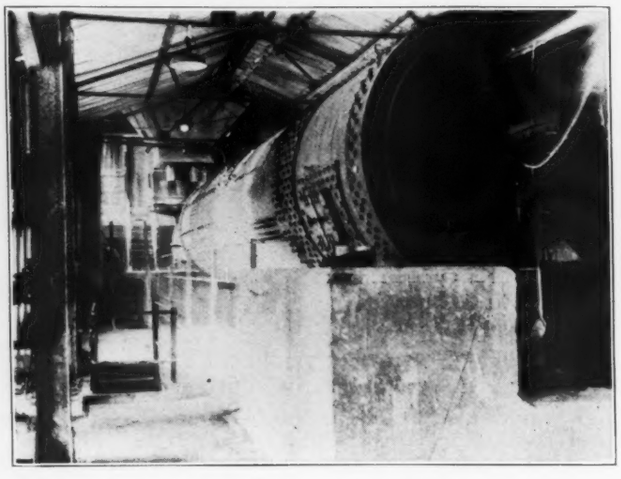
This comparatively new plant of the Ketton Portland Cement Co., Ltd., is prepared to manufacture 70,000 tons of cement per year, but it was designed and erected in such a way that, at comparatively small cost, the capacity can be increased to 180,000 tons per annum. Most of the major equipment for this plant was furnished by F. L. Smidth & Co.

The raw materials—clay and limestone—are obtained close to the works on the company's property. These are mixed in the approximate proportion of 1 clay to 3 limestone, the yearly requirement for capacity production being about 30,000 tons of clay and 85,000 tons of stone. A steam shovel (navvy) excavates the clay which overlies the limestone. Until sufficient clay has thus been stripped to permit good quarrying of the stone, the stone supply is obtained from the dumps remaining from quarrying operations during the past eight centuries. These dumps contain about three million tons of good limestone and its utilization involves no drilling or blasting costs.

Clay is hauled to the wash mill in cars (wagons) of 4-cu.yd. capacity. It is then mixed with water into a slurry which is pumped to either of two basins A and B. When a basin is filled, a sample is analyzed for silica, alumina and iron-oxide. Cor-



Discharge end of the rotary kiln showing coolers.



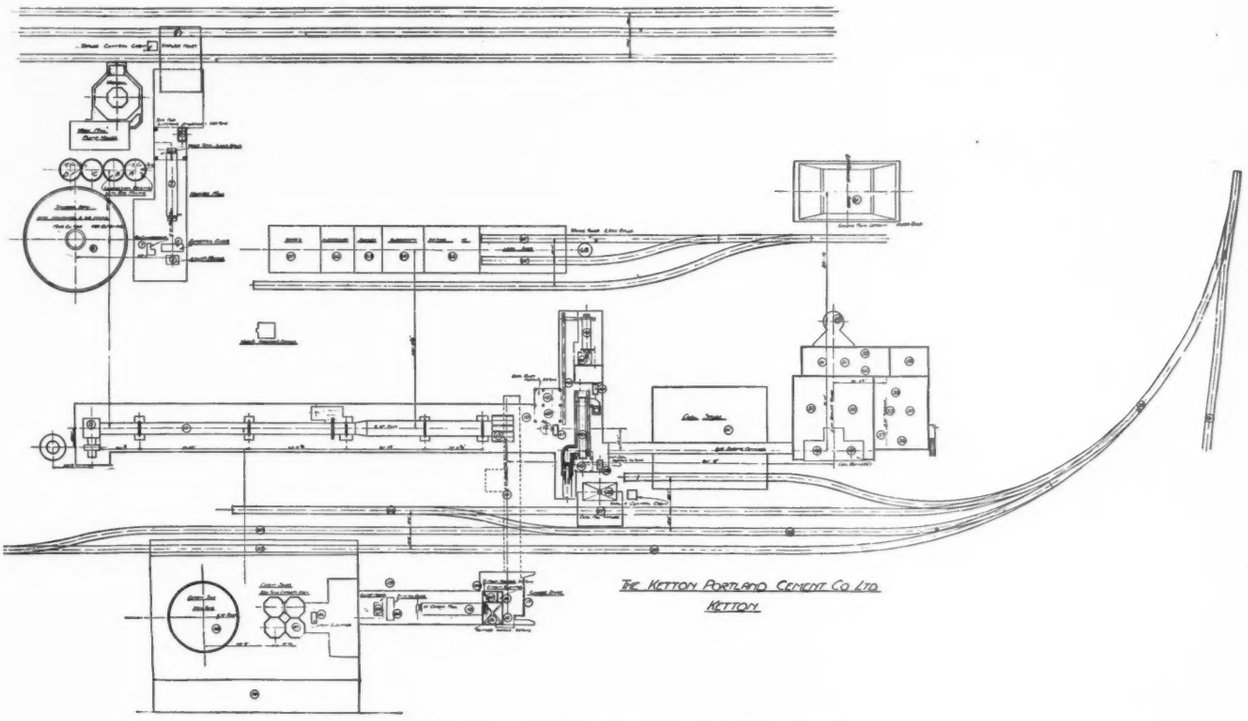
Compartment mill for raw-material grinding.

rections are easily made as both highly siliceous and highly aluminous clays occur on the property.

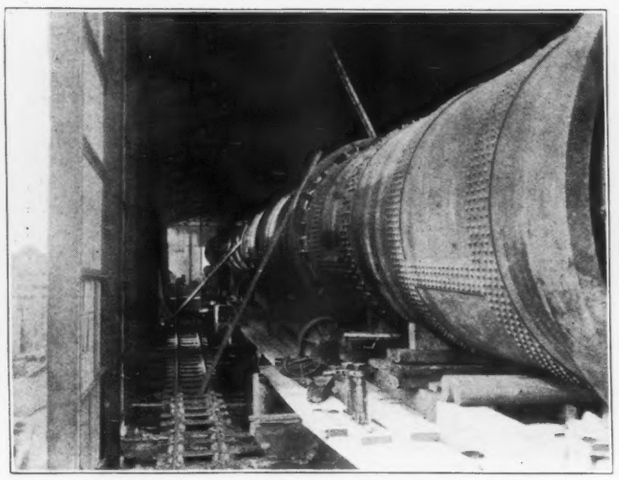
Limestone is transported in railway cars (trucks), each containing about twelve tons. At the tipple an ingenious tippler hoist lifts each loaded car about 28 ft. and dumps the rock into a hopper from which it is fed into the crusher at the rate of about fifty tons per hour. The stone issues from the crusher at a maximum size of 1½ in. and is taken by an elevator to a 260-ton-capacity silo which can supply the balance of the mill with feed if rock is not being crushed.

From the hopper of the silo, the stone is fed, at the rate of 12 tons per hour, to the raw-grinding mill together with the proper amount of slurry. This mill has a speed of 20 r.p.m. and carries a 44-ton charge of steel balls. It is driven through a reducing gear by a 650-hp. motor which runs at 750 r.p.m.

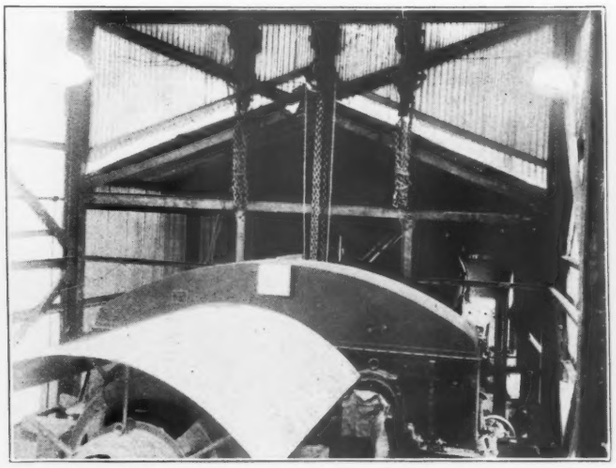
The ground slurry is next pumped to basins C and D where it is given pneumatic agitation, sampled, analyzed and corrected, before being run into the main storage basin which has a capacity of 1,500 cu.yd. Here the slurry is continually agitated, ordinarily by mechanical means. The basin is equipped with aërating apparatus which is employed, occasionally, to augment the agitation.



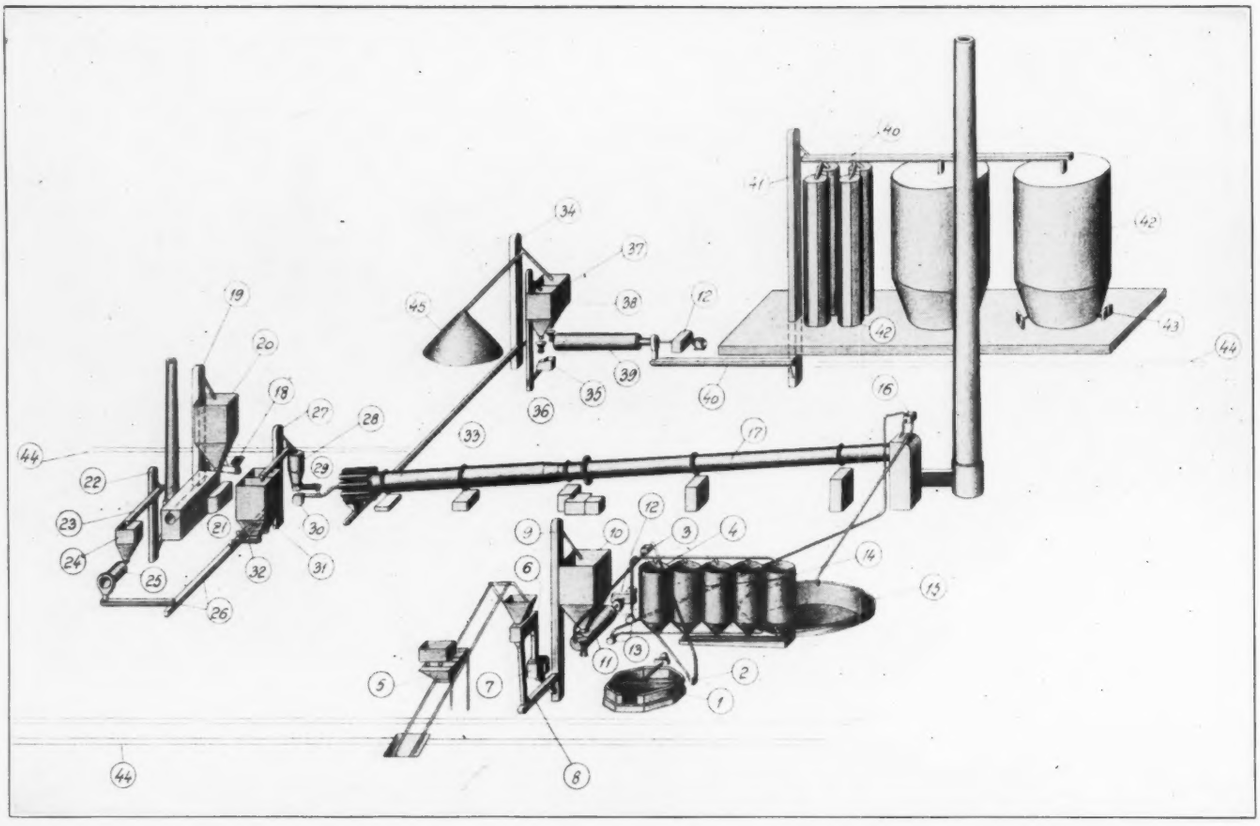
Drawing showing general lay-out of the Ketton cement plant.



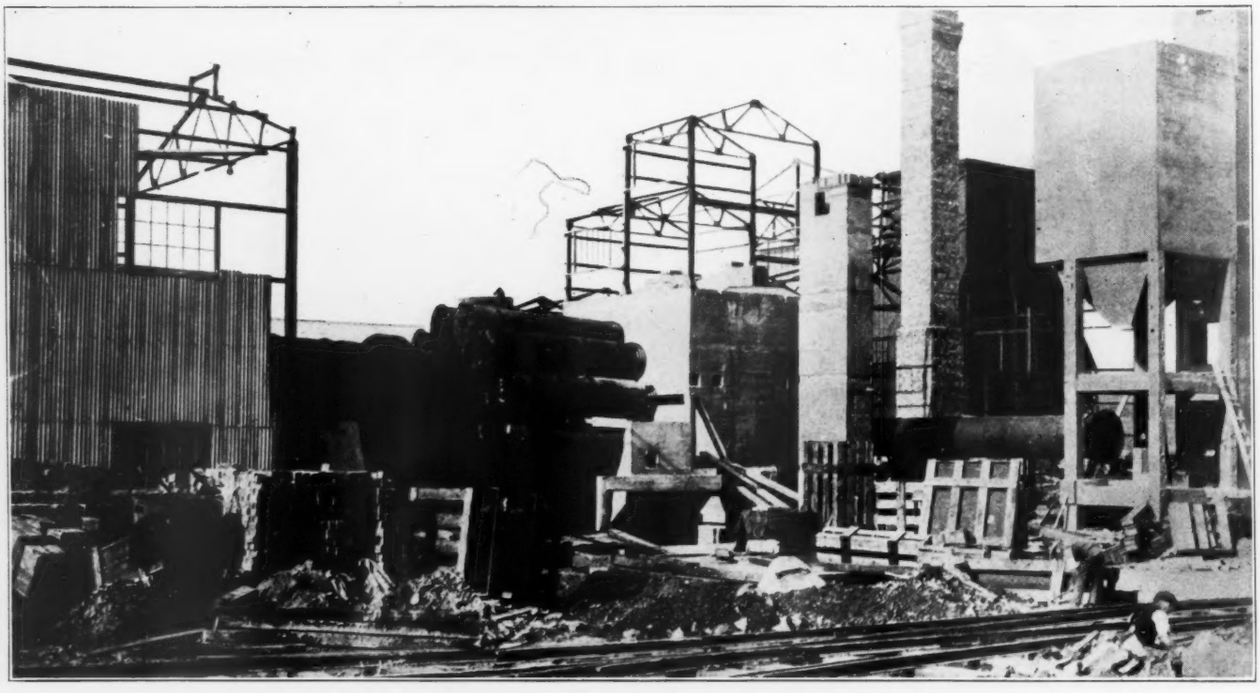
Looking toward the feed end of the kiln.



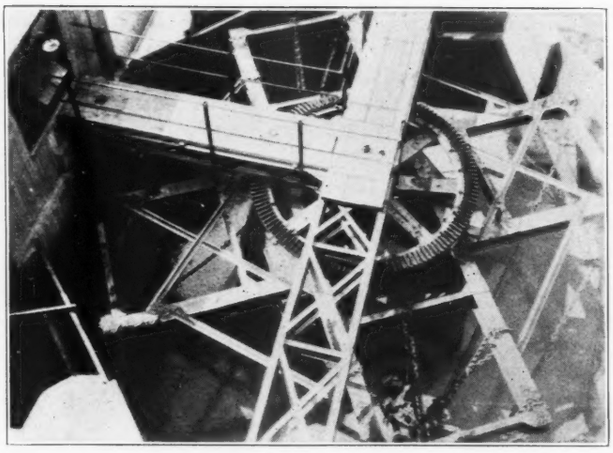
Drive of the finish-grinding mill.



Perspective drawing of the Ketton plant. The key numbers are as follows: (1) Clay wash mill; (2) Centrifugal pump for clay slurry; (3) Measuring apparatus for clay slurry; (4) Clay slurry tank; (5) Tippler for limestone trucks; (6) Grizzly feeder for limestone (7) Hammer mill for limestone; (8) Band conveyor for limestone; (9) Elevator for limestone; (10) Hopper for limestone; (11) Unidan mill for slurry; (12) Symetro gear; (13) Centrifugal pumps for slurry; (14) Slurry tanks; (15) Sun-and-planet mixer; (16) Slurry measuring apparatus for kiln; (17) Unax kiln; (18) Band conveyor for coal; (19) Elevator for coal; (20) Hopper for wet coal; (21) Coal-drying drum; (22) Elevator for dried coal; (23) Worm conveyor for dried coal; (24) Hopper for dried coal; (25) Tubemill for coal; (26) Worm conveyors for coal dust; (27) Elevator for coal dust; (28) Hopper for coal dust; (29) Measuring worms for coal dust; (30) Fan for coal dust; (31) Silos for coal dust; (32) Extracting worms for coal dust; (33) Shaking conveyor for clinker; (34) Elevator for clinker; (35) Crusher for gypsum; (36) Elevator for gypsum; (37) Hopper for clinker; (38) Hopper for gypsum; (39) Unidan mill for cement; (40) Worm conveyor for cement; (41) Elevator for cement; (42) Cement silos; (43) Exilor packers; (44) Railway tracks; (45) Clinker stock.



Construction view showing the kiln and coolers. Coal drier at right.



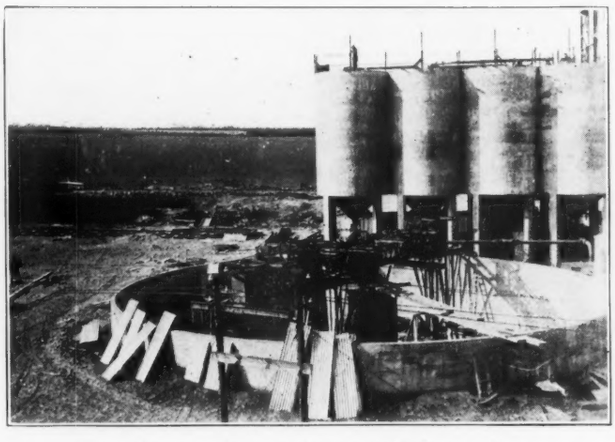
The clay wash mill viewed from above.

The slurry is pumped from the basin to a feeding device at the upper end of the 248-ft. kiln. Pulverized coal is used as fuel. The clinker is formed at a temperature of 1,600 to 1,700 deg. C. and discharges from the extreme end of the kiln into a set of parallel cylindrical coolers which revolve as a unit with the kiln itself and in which the clinker is cooled by cold air. The same air, when thus heated, is used for combustion of the coal dust.

The cooled clinker drops to a shaking conveyor, is delivered to an elevator, and is then raised into the clinker silo or deposited in the storage.

From the silo, the clinker is fed to the finish mill at the rate of about ten tons per hour. In this tube mill the material is ground so that there is a residue of only 3 per cent. on a 180-mesh sieve. Gypsum, as a retarder, is added in the proportion of 2 to 3 per cent. The gypsum, upon being brought from storage, is crushed finely, elevated, and deposited in the feed hopper. The finish mill is driven through a speed reducer by a 650-hp. motor.

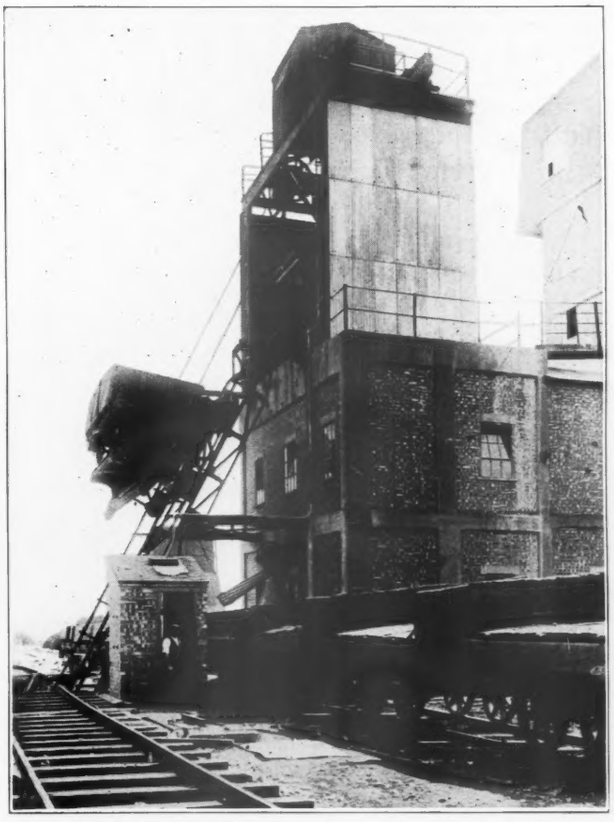
The finished cement, upon leaving the finish mill, is conveyed to an elevator which lifts it about 75 ft. to be distributed to numerous 250-ton-capacity silos or to a single 3,500-ton-capacity silo. The smaller silos are octagonal in plan while the large silo is cylindrical. Their combined storage capacity is 9,000 tons.



Four slurry tanks and the sun-and-planet mixer.

From the silos, the cement is handled by vacuum pumps to the automatic packers. The sacked cement is wheeled directly into railway cars for shipment. The track has a slope of 1 ft. in 75 ft. so that cars (wagons) run by gravity to the loading platform and then, when loaded, coast to the siding.

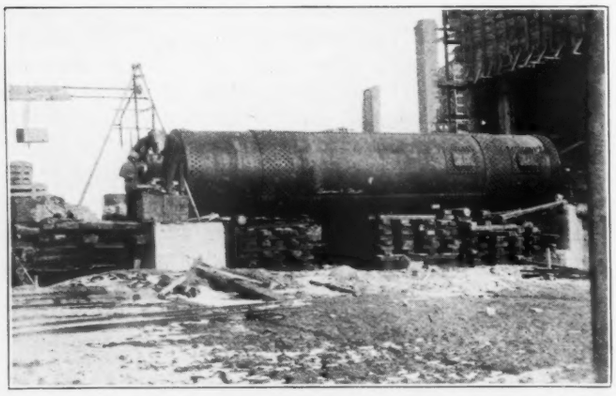
The burning of 100 tons of finished cement requires the consumption of 25 tons of coal. As each carload of coal is received it is gravitated to a tipple which inverts the car and dumps the coal into a track hopper whence it is conveyed and elevated, at the rate of 40 tons per hour, to either storage or the coal silos. One silo stores coal for the boiler house, the other for the kiln. From the latter silo, the coal feeds into a drier. After drying, the coal is elevated to a hopper and fed into a grinder and then is conveyed and elevated into another hopper.



Hoist which elevates stone cars to the crusher.

When this hopper becomes filled, the coal goes automatically into storage silos which, when full, contain sufficient coal dust to run the kiln 24 hours. Dust is withdrawn from the silos to the conveyor by which the coal was brought from the mill and is delivered to an elevator which feeds the kiln hopper already mentioned.

All machinery is driven by electric motors whose total power amounts to 1,300 kw. As electric power could not be purchased to advantage, the company built its own power plant which contains modern steam boilers, accessories and a turbine-generator set of 1,850-kw. capacity. This electric power is used for all the plant's mechanical drives. For illumination and repair work when the works may



One of the grinding mills being installed.

be closed down, electric power is generated by a Diesel-driven set. The turbo-alternator current is at 3,300 volts, the correct voltage for all the motors of 100 hp. or more. The current is stepped down to 440 volts for other motors.

The works include shops for blacksmithing, carpentering and electrical jobs, as well as a storeroom, a laboratory, and offices.

Every day 36 tensile briquets are made. These are tested for strength at 1, 2, 3, 7 and 28 days. The certified tensile strength of the "Ketco" cement in a mortar of 1 cement to 3 standard sand is:

1 day, 400 lb. per sq. in.
2 days, 525 lb. per sq. in.
3 days, 543 lb. per sq. in.
7 days, 635 lb. per sq. in.

Tests of neat cement at 7 days show an average tensile strength of 1,245 lb. per sq. in., the British standard specifications calling for only 600 lb.

The averages for compression tests taken over a three-weeks' period by a London firm of consulting chemists are most favorable. With 3-in. cubes made from a mortar of 3 parts standard sand to 1 part "Ketco" cement, the rupture strengths averaged at: 2 days, 3,872 lb.; 7 days, 7,757 lb.; 28 days, 10,279 lb.; and 3 months, 11,982 lb.

Another firm of chemists reported a compressive strength of 5,400 lb. at one day with 3 parts sand and 1 part of "Kettocrete," the rapid-hardening cement manufactured by this company.

Increased Duty on Cement Urged

(Continued from page 69)

Giffroy denied that there was any allocation of territory, although the group of mills in the coöperative plan carry along on a *pro rata* basis of costs. He estimated that the duty imposed by the United States cut imports of cement into the United States from Belgium, in 1929, by 40 per cent. and that, during the first quarter of 1931, the imports ran only about half of those of the corresponding period in 1930.

W. M. Richardson, testifying to bear out Mr. Giffroy's statements, stated vehemently that the domestic producers are not in need of a protective tariff because the importers already have been forced out of the field, and added "a little judicious squeezing out of water" in the capitalization of some of the domestic concerns would serve greatly to reduce some of the costs complained of.

Discussing advantages and disadvantages of the importers Mr. Miller, who has been importing to Boston principally from Belgium, said that the importers are under the necessity of bringing in large quantities of cement, in order to have a supply on hand when demanded; that they must count on from six to seven weeks to receive orders, and must overcome sales resistance of prospective customers who fear possible loss of cargo at sea, damage or other delay in fulfillment of orders.

Mr. Hollander testified that imports of cement have fallen off 72 per cent. since the peak year, 1925, when imports amounted to 2½ per cent. of domestic production. He gave 1928 as the peak year of production for the domestic manufacturers and testified that the domestic output has fallen only 7½ per cent. During 1930, the year in which the tariff went into effect, imports dropped 43 per cent. below 1929, he said, and during the six months of tariff, July to December, 1930, imports fell 61 per cent. below the corresponding period of the preceding year.

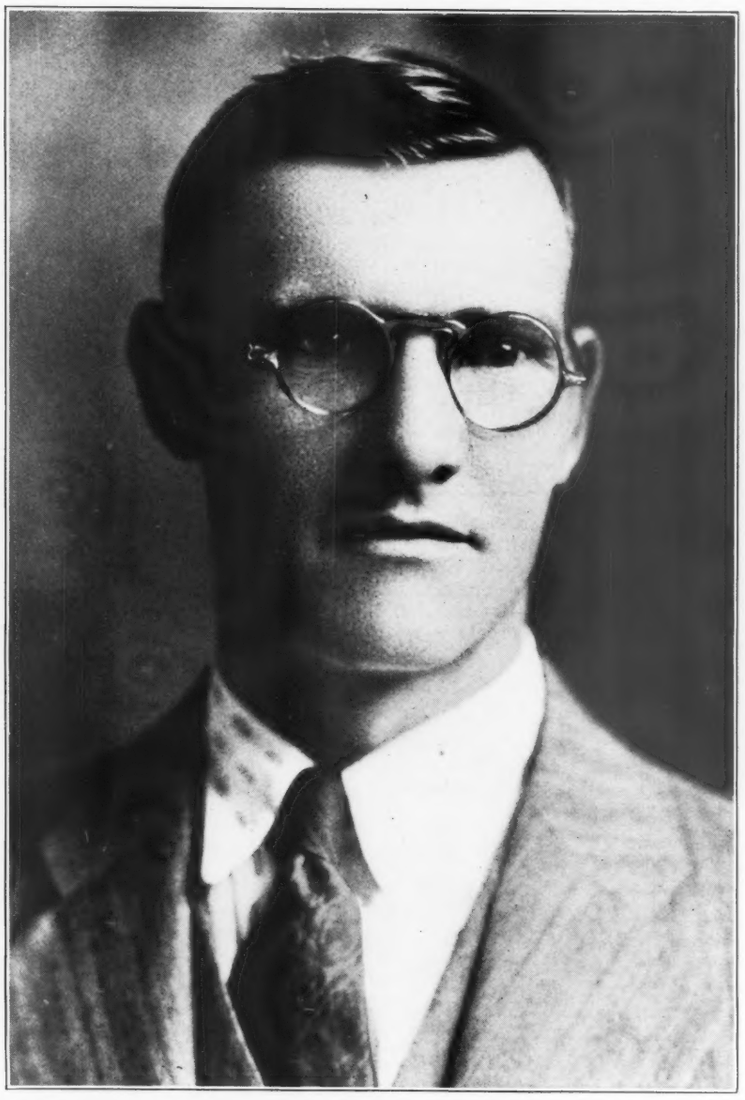
The domestic manufacturers' attorneys presented a large map of the United States divided into six districts, No. 1 embracing the extreme northeast tip of the country, No. 2 the extreme central eastern portion, and No. 3 the lower southeastern portion. Area No. 4 embraced Texas, as a state; No. 5, California, and No. 6 the far northwestern portion of the United States. Contending that the picture of cement competition in this country is largely one of freight rates, Mr. Barnes sought to show, throughout, what he called ruinous effects the domestic manufacturers suffered in trying to compete with imported foreign cements in seaport areas.

The domestic manufacturers all declared that exportation of American cement to Porto Rico and other export markets also had been ruined by low freight charges enjoyed by foreign competitors, principally the Belgians and Danes. Numerous instances of contracts awarded to concerns handling foreign cements, on public works, private projects and semi-private jobs, principally highways, schools, piers and public buildings, were cited. Domestic manufacturers' could not even begin to compete on the bigger jobs because of the lower prices of the imported cement, it was testified. As one witness put it, the importers "take the cream of the big jobs and leave the scattered no-account contracts to the domestic mills."

Several of the domestic mills representatives told at length of attempts to stem the adverse tide by resorting to differential rates, reductions in price, etc., but all agreed it was to no avail. One of the harmful results, they stated, was that in lowering prices to compete with the foreign cement at seaport areas, the domestic mills were forced to use a scale-back method that lowered rates over areas backward toward their "safe" inland territory, so that buyers began charging sectional favoritism in the companies' price policies.

MEN OF THE INDUSTRY

The portrait printed on this page in each number of PIT AND QUARRY is selected without significance as to current events or the position of the individual in the industry.



E. L. DRURY
Superintendent
Mildred, Kan. Plant
Consolidated Cement Corp.

Coming Events

July 9, 1931. St. Louis, Mo. Monthly meeting, St. Louis Quarrymen's Assn., Forest Park Hotel. E. J. McMahon, exec. sec., 4063 Forest Park Blvd., St. Louis, Mo.

Sept. 4, 5, 1931. Fresno, Cal. Regular meeting, California Associated Concrete Pipe Manufacturers, Hotel Fresno. A. A. Clark, secretary, Box 368, Visalia, Cal.

October 12-16, 1931. Chicago, Ill. National Safety Congress. W. H. Cameron, secretary, National Safety Council, 20 N. Wacker Drive, Chicago, Ill.

Jan. 9-15, 1931. Detroit, Mich. Annual Convention and show, American Road Builders Assn. Chas. M. Upham, engineer-director, National Press Bldg., Washington, D. C.

Jan. 25-26, 1932. Pittsburgh, Pa. Annual convention, National Ready-Mixed Concrete Assn., Wm. Penn Hotel. V. P. Ahearn, executive secretary, Munsey Bldg., Washington, D. C.

Jan. 27-29, 1932. Pittsburgh, Pa. Annual convention, National Sand & Gravel Assn., Wm. Penn Hotel. V. P. Ahearn, secretary, Munsey Bldg., Washington, D. C.

Feb. 3-4, 1932. Washington, D. C. Annual meeting, Sand-Lime Brick Assn. Ellen Knight, sec., 321 N. Hamilton St., Saginaw, Mich.

Feb. 23-26, 1932. Washington, D. C. Annual convention, American Concrete Institute, Wardman Park Hotel. Harvey Whipple, sec., 2970 West Grand Blvd., Detroit, Mich.

Pumpings from the Old Pit

Excerpts from the old files of PIT AND QUARRY *reveal many interesting sidelights on the activities of the pits, quarries and plants of former days. These are printed in this column each issue.*

Fourteen Years Ago

THE Arkansas Lime Co. of Ruddles, Ark., announced tentative plans for the erection of a plant to grind glass sand. Three new glass factories at Fort Smith, Ark., had opened up a market for the material.

* * *

The Wolverine Sand & Gravel Co., of Detroit, Mich., increased its capitalization from $30,000 to $40,000.

* * *

G. E. Land was named advertising manager of the Blaw Steel Construction Co. of Pittsburgh, Pa.

* * *

Ten Years Ago

DRILLERS were at work near Rapid City, S. D., putting down test holes to determine the quality of limestone deposits on a site chosen for the erection of a state-owned cement plant to be built at a cost of $300,000.

* * *

The Union Sand & Mfg. Co. of Fort Worth, Tex., was incorporated with $100,000 capital for the development of a large sand-and-gravel deposit near Fort Worth. The company announced plans for the erection of a plant to have an ultimate capacity of 750 tons of material per day.

* * *

Paul D. Hoel was elected secretary-treasurer of the Michigan Sand & Gravel Assn. and established his offices at Kalamazoo, Mich. Other officers elected were Lee E. Denton, Saginaw, Mich., president; and W. F. Fischer, Tecumseh, vice-president.

The vital necessity for coöperation was the keynote of the address of Charles Warner, president, at the annual convention of the National Lime Assn. at the Commodore Hotel, New York.

* * *

Five Years Ago

THE old Mission Portland Cement Co. announced plans for the expenditure of $750,000 for improvements at its San Juan, Cal., plant. An aërial tramway was the most important addition under consideration.

* * *

All records for weekly loadings of sand, gravel and crushed stone were broken when 83,441 cars were loaded by producers.

* * *

J. E. Jellick was promoted to the position of regional manager of the Pacific Coast offices of the Portland Cement Assn. Amos H. Potts was named district engineer of the Los Angeles office to succeed Mr. Jellick.

Sales Agents Appointed by Meter Manufacturer

The Meriam Co., Cleveland, O., manufacturer of flow meters, has appointed Anderson Engineering Co., 42 Church St., New Haven, Conn., Leonard Maleson Co., 815 Locust St., Philadelphia, Pa., S. D. Shook & Co., 528 Duquesne Way, Pittsburgh, Pa., and Mayer & Oswald, 332 S. La Salle St., Chicago, as exclusive representatives in their respective territories.

State Distributors for Dump Wagons Appointed

The Northfield Iron Co. of Northfield, Minn., has been appointed distributor for the Camel dump wagon in Minnesota, Wisconsin, North and South Dakota by the Shunk Mfg. Co. of Bucyrus, O.

Other appointments made recently are:

The John V. Griffith Co., 2608 Garland Ave., Cincinnati, O., distributors for Ohio; Harrie R. Williams, 564 Maryland Ave., Bellevue, N. S., Pittsburgh, Pa., factory representative for Pennsylvania; The Nixon-Hasselle Co., 13th and Carter Sts., Chattanooga, Tenn., for Tennessee, east of the Tennessee River; Thos. L. Barret, 112 S. Second St., Louisville, Ky., state distributor for Kentucky.

New Corporations

COLORADO QUARRIES, INC., 904 Equitable Bldg., Denver, Colo. $45,000 and 2,000 sh. n.p.v. F. H. Knollman, J. McMillan and D. K. McMillan.

SUGAR CREEK STONE CO., Charlotte, N. C. $50,000. D. C. Dunn, 612 Grandin Road.

SUPERIOR LIME & MINING CO., Wenatchee, Wash. $50,000. John Savage, J. W. Hatley and others.

BLUFF CITY SAND & GRAVEL CO., Bluff City, Tenn. 3,000 sh. n.p.v. W. H. Herbert, W. W. Sullivan and J. D. Williams.

ARKANSAS SAND & GRAVEL CO., Fort Smith, Ark. $25,000. F. R. Euper, president.

LAND & PHOSPHATE CO., Newberry, Fla. J. E. Wideman, 245 Valencia St.

WHITE SHELL CORP., Jacksonville, Fla. A. Zetrouer, 1535 Main St., mgr.

AETNA CLAY & ROCK PRODUCTS, INC., Las Vegas, Nev. $500,000. T. R. Brown, E. Armstrong, L. M. Dunn, E. Watson and H. Connell, all of Reno.

EMPIRE STATE CONCRETE PIPE CORP., 154 Nassau St., New York, N. Y. $150,000. D. E. Newberger.

PRECAST SLAB & TILE CO., St. Louis, Mo. Holden Brock, 4258 McRee St.

CEMENT-WRAPPED PIPE CO., LTD., Phoenix, Ariz. 500,000 sh. common at $1.00 ea. and 50,000 sh. preferred at $10.00 ea. R. G. Norton and C. J. Bustrin, Phoenix, Ariz., and P. J. Hovde, Mesa, Ariz.

Cement Directory Issued by Pulverizer Company

The 1931 edition of the American Cement Directory is being distributed by the Bradley Pulverizer Co., Boston, Mass., with works at Allentown, Pa. This company manufactures mills for pulverizing cement rock and clinker, ores, phosphate rock, coal, and in presenting the directory it calls attention to "improvements in grinding practice brought about by recent adoption of closed-circuit operation in many cement plants."

Personal Mention

R. T. Eckert, formerly of the service department, Lehigh Portland Cement Co., Chicago, is now connected with the Makins Sand & Gravel Co., Oklahoma City, Okla.

C. H. Wolfe was recently appointed purchasing agent of the American Gypsum Company, Port Clinton, Ohio. Mr. Wolfe previously held this position from 1919 to 1929, and is well known in the industry.

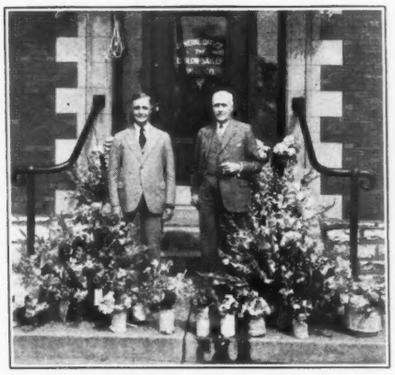
William L. Hartley has been named district sales manager in charge of the Detroit territory by Link-Belt Co., Chicago, Ill. Mr. Hartley has been in the employ of Link-Belt since 1915, having started in the engineering department, working in the contract, standard and estimating departments. In 1926 he was promoted to the general sales department, and in 1927 was transferred to the Kansas City office. Since 1928 he has been in charge of the Foundry Sales Division of the company.

W. S. Keith, formerly manager for the Standard Gypsum Co. in Seattle, is now associated with The Construction Specialties Co., of Seattle. This company specializes in concrete waterproofing, and in the construction of industrial floors. Mr. Keith is also the western representative of the Peerless White Lime Co. of St. Louis, Mo., handling Peerless hydrate, a finely ground high-calcium hydrate used in the manufacture of plywood glue, spray spreader, varnish, cold water paint, etc.

Charles E. Shearer was appointed assistant sales manager by the Keystone Portland Cement Co., effective June 1. He was with the Atlas Portland Cement Co. for a number of years in Philadelphia and Chicago. Following the sale of this company to the United States Steel Corp. he became associated with the Pennsylvania-Dixie Cement Corp. Among other duties Mr. Shearer will concentrate on the promotion and sale of Velroca high-early-strength Portland cement, Keystone's new product.

H. A. Jackson, president of the Chicago Pneumatic Tool Co., New York, announces the election as executive vice-president of **W. L. Lewis** who, for the past year, has been vice-president in charge of finance of this company and was formerly assistant comptroller of the Bethlehem Steel Corp.

A. E. Hutchinson, Coral Gables, Fla., and **A. H. Chancey,** Miami, Fla., are investigating phosphate-rock deposits south of Zephyrhills, Fla., with a view to establishing a plant.



Edwin J. Gould (left) and Frank Low.

Frank Low, vice-president and general sales manager of the Ludlow-Saylor Wire Co. of St. Louis, and **Edwin J. Gould,** vice-president and general superintendent in charge of operations at the company's wire-cloth plant in St. Louis, were honored by their fellow workers with many floral tributes and other expressions of esteem recently on the occasion of their fortieth and fiftieth anniversaries in the service of the firm.

J. C. McQuiston, general advertising manager of the Westinghouse Electric & Manufacturing Co., has announced his retirement, effective June 1. In his decision to retire from Westinghouse he brings to an end a record of continuous advertising administration for one company unparalleled in American industry. For 29 years Mr. McQuiston has been in charge of advertising for Westinghouse during which time the status of advertising and sales promotion, distribution and other allied phases of his profession have gone through as many changes as the electrical industry itself.

Philip S. Rinaldo.

H. R. Bowers, formerly with The Bailey Meter Co., is now manager of sales and advertising for The Meriam Co., Cleveland, O., manufacturers of flow meters.

Charles P. Weekes, vice-president in charge of Eastern sales for the Hercules Motors Corp. of Canton, O., sailed June 4 for Russia where he will spend several weeks in the interests of his organization. During Mr. Weekes' absence, **A. B. Wehling** will have charge of the corporation's eastern office in the Chanin Bldg., New York, N. Y. **W. W. Cromley,** for many years identified with the internal combustion engine industry, has joined the Hercules staff of sales representatives, while **Harry E. Blasingham** has recently been appointed general purchasing agent in entire charge of all Hercules purchases and stores.

Obituary

Tyler Henshaw, vice-president of the Riverside Portland Cement Co., died at his residence in San Francisco, Cal., June 2. He was one of the original promoters of the Riverside cement mill at Creatmore, Riverside County, which was built in 1910.

Mrs. Belle Hallock Colgan, 47, owner of the Colgan Limestone & Products Co., died May 30 at her home at 54 Miami Ave., Columbus, O., after several weeks' illness. Funeral was held June 1, with interment in Green Lawn Cemetery.

Mrs. Colgan was the widow of Frank J. Colgan, former president of the Colgan Limestone & Products Co., who died two years ago.

Philip S. Rinaldo, president of the Flexible Steel Lacing Co., passed away in Chicago recently at the age of 54. In March, 1907, Messrs. Rinaldo, A. B. Beach and G. E. Purple founded the Flexible Steel Lacing Co. Mr. Rinaldo was secretary and treasurer of the company from its beginning, and in later years, general manager. In February of this year he was elected president to succeed Mr. Purple, whose death occurred November 3, 1930. He is survived by his widow, two daughters and three sons. The oldest son, Phillip, is associated with the company as assistant treasurer.

Latest Portland-Cement Statistics

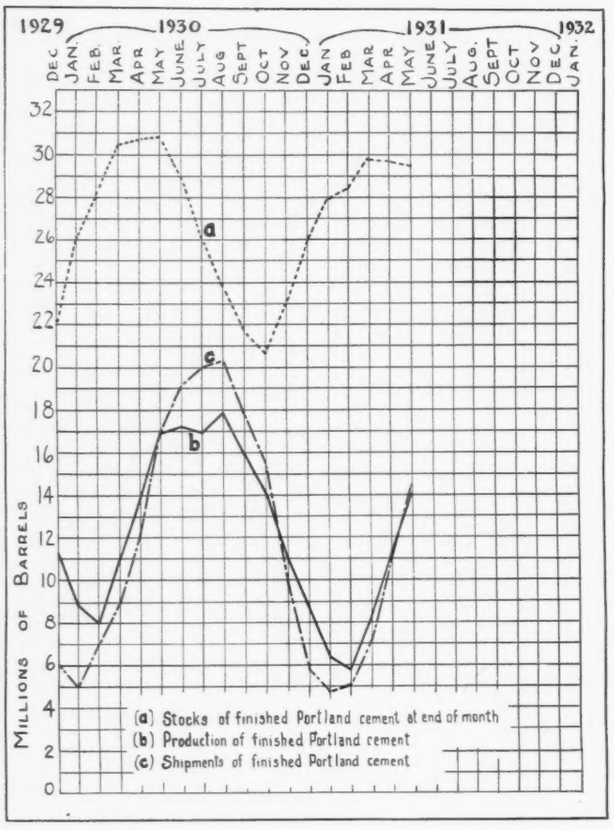

1929
1930
1931
1932
DEC JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE JULY AUG. SEPT OCT NOV DEC JAN
MILLIONS OF BARRELS
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32
a
b
c
(a) Stocks of finished Portland cement at end of month
(b) Production of finished Portland cement
(c) Shipments of finished Portland cement

Chart showing production, shipments and stocks on hand, by months, from December, 1929, to May, 1931.

THE Portland cement industry in May, 1931, produced 14,006,000 barrels, shipped 14,222,000 barrels from the mills, and had in stock at the end of the month 29,447,000 barrels. Production of Portland cement in May, 1931, showed a decrease of 18.8 per cent and shipments a decrease of 17.4 per cent, as compared with May, 1930. Portland cement stocks at the mills were 4.7 per cent lower than a year ago.

In the statement of relation of production to capacity the total output of finished cement is compared with the estimated capacity of 165 plants at the close of May, 1931, and of 166 plants at the close of May, 1930. The estimates include increased capacity due to extensions and improvements during the period.

DISTRIBUTION OF CEMENT

Shipped to—	March		April	
	1930	1931	1930	1931
Alabama	104,750	175,601	126,501	219,593
Alaska	864	1,111	2,988	1,153
Arizona	44,917	53,821	45,312	47,083
Arkansas	86,481	74,368	130,247	183,121
California	718,840	691,790	823,295	653,624
Colorado	57,317	42,724	85,644	70,204
Connecticut	109,085	82,833	184,816	150,380
Delaware	19,467	14,473	32,573	32,856
District of Columbia	70,893	76,232	82,913	119,153
Florida	87,400	49,466	104,898	61,526
Georgia	101,858	151,326	139,155	182,817
Hawaii	22,829	24,602	26,240	20,849
Idaho	18,305	16,408	25,650	21,558
Illinois	379,453	279,580	694,367	717,468
Indiana	201,551	130,801	386,945	256,697
Iowa	117,907	121,769	447,570	309,768
Kansas	178,877	133,354	283,917	184,369
Kentucky	72,496	97,970	118,156	197,013
Louisiana	285,435	216,170	374,620	277,366
Maine	33,975	19,556	64,470	36,091
Maryland	172,822	103,592	257,033	181,752
Massachusetts	191,190	151,893	320,443	279,032
Michigan	344,412	200,479	599,371	395,559
Minnesota	91,055	106,842	248,088	268,765
Mississippi	56,606	29,594	42,812	53,159
Missouri	264,930	221,789	529,829	406,831
Montana	18,316	19,072	37,562	24,187
Nebraska	83,042	58,027	153,348	131,416
Nevada	11,923	9,804	15,637	11,722
New Hampshire	19,963	11,868	45,594	30,884
New Jersey	456,109	285,359	623,867	484,331
New Mexico	23,641	23,879	35,730	30,751
New York	1,095,878	1,035,782	1,556,095	1,527,913
North Carolina	101,751	92,639	141,565	123,303
North Dakota	20,791	17,176	39,253	35,616
Ohio	425,559	308,587	823,451	491,647
Oklahoma	283,365	136,628	381,939	244,250
Oregon	101,258	84,549	72,861	105,653
Pennsylvania	700,482	458,913	1,088,646	697,081
Porto Rico	2,125	2,672	1,300	2,825
Rhode Island	45,477	25,935	73,396	73,310
South Carolina	62,241	214,460	81,105	234,756
South Dakota	28,448	28,631	36,414	56,775
Tennessee	143,103	91,664	236,120	151,183
Texas	618,703	428,923	713,051	524,419
Utah	40,937	28,086	53,292	31,633
Vermont	23,132	7,389	32,457	22,391
Virginia	120,043	118,992	148,622	162,050
Washington	214,098	174,642	276,475	211,323
West Virginia	75,381	70,953	120,687	92,214
Wisconsin	159,096	119,628	299,210	288,648
Wyoming	9,934	8,585	15,870	13,920
Unspecified	40,274	16,947	14,500	19,876
	8,758,785	7,147,934	13,295,900	11,151,864
Foreign countries	67,215	44,066	44,100	32,136
Total shipped from cement plants	8,826,000	7,192,000	13,340,000	11,184,000

EXPORTS OF HYDRAULIC CEMENT BY COUNTRIES IN APRIL, 1931

Exported to—	Barrels	Value
Canada	2,843	$10,421
Central America	1,891	5,311
Cuba	2,963	7,212
Other West Indies and Bermuda	9,024	14,112
Mexico	4,028	13,002
South America	17,627	54,647
Other Countries	2,102	11,859
Total	40,478	116,564

IMPORTS OF HYDRAULIC CEMENT BY COUNTRIES AND BY DISTRICTS, IN APRIL, 1931

Imported from—	District into which imported	Barrels	Value
Belgium	Massachusetts	16,111	$19,806
Canada	Maine and New Hampshire	54	185
	Vermont	23	58
	Total	77	243
Denmark	New York	24,204	24,782
	Porto Rico	9,153	9,238
	Total	33,357	34,020
France	New York	1,384	3,152
Germany	New York	997	1,727
Japan	Hawaii	2,791	2,780
	Grand total	54,717	61,728

RELATION OF PRODUCTION TO CAPACITY

	May		April	March	February
	1930 (*per cent*)	1931 (*per cent*)	1931 (*per cent*)	1931 (*per cent*)	1931 (*per cent*)
The month	78.9	62.8	52.1	36.9	29.4
The 12 months ended	66.2	56.5	57.7	58.6	59.7

PRODUCTION, SHIPMENTS, AND STOCKS OF FINISHED PORTLAND CEMENT, BY MONTHS, IN 1930 AND 1931 (*In thousands of barrels*)

Month	Production		Shipments		Stocks at End of Month	
	1930	1931	1930	1931	1930	1931
January	8,498	6,595	4,955	4,692	27,081	27,759
February	8,162	5,920	7,012	5,074	28,249	28,612
March	11,225	8,245	8,826	7,192	30,648	29,676
April	13,521	11,245	13,340	11,184	30,867	29,663
May	17,249	14,006	17,224	14,222	30,891	29,447
June	17,239	.....	18,781	.....	29,364	.....
July	17,078	.....	20,153	.....	26,289	.....
August	17,821	.....	20,299	.....	23,824	.....
September	16,124	.....	18,083	.....	21,889	.....
October	14,410	.....	15,599	.....	20,697	.....
November	11,098	.....	8,784	.....	23,056	.....
December	8,480	.....	5,688	.....	25,883	.....
Totals	160,905	.....	158,744	.....	.....	.....

PRODUCTION AND STOCKS OF CLINKER, BY DISTRICTS, IN MAY 1930 AND 1931 (*In thousands of barrels*)

District	Production		Stocks at End of Month	
	1930	1931	1930	1931
Eastern Pa., N. J., and Md	3,543	3,004	2,340	1,923
New York and Maine	1,067	1,028	986	1,403
Ohio, Western Pa., and W. Va	1,988	1,188	1,749	1,634
Michigan	1,204	577	1,847	1,679
Wis., Ill., Ind., and Ky	2,197	1,685	2,544	1,706
Va., Tenn., Ala., Ga., Fla., and La	1,403	1,283	1,074	736
Eastern Mo., Ia., Minn., and S. Dak	1,802	1,318	1,221	1,027
W. Mo., Neb., Kans., Okla., and Ark	1,272	1,125	446	732
Texas	596	496	379	193
Colo., Mont., Utah, Wyo., and Idaho	313	312	184	303
California	858	854	1,315	1,262
Oreg. and Wash	364	343	583	411
Totals	16,607	13,213	14,668	13,009

PRODUCTION, SHIPMENTS, AND STOCKS OF FINISHED PORTLAND CEMENT, BY DISTRICTS, IN MAY 1930 AND 1931, AND STOCKS IN APRIL, 1931 (*In thousands of barrels*)

District	May						Stocks at End of April 1931
	Production		Shipments		Stocks at End of Month		
	1930	1931	1930	1931	1930	1931	
Eastern Pa., N. J., and Md	3,707	3,053	3,746	2,952	6,998	6,826	6,725
New York and Maine	1,176	1,106	1,191	1,137	1,847	2,044	2,076
Ohio, Western Pa., and W. Va	2,112	1,289	1,974	1,252	4,102	3,513	3,476
Michigan	1,419	722	1,229	825	2,785	2,482	2,586
Wis., Ill., Ind., and Ky	2,143	1,913	2,026	1,743	4,808	4,378	4,208
Va., Tenn., Ala., Ga., Fla., and La	1,306	1,418	1,192	1,428	1,865	1,630	1,639
Eastern Mo., Ia., Minn., and S. Dak	1,763	1,335	2,184	1,538	3,628	3,861	4,064
W. Mo., Neb., Kans., Okla., and Ark	1,360	1,248	1,390	1,307	1,807	1,827	1,885
Texas	630	600	620	644	836	734	777
Colo., Mont., Utah, Wyo., and Idaho	314	296	290	300	563	596	600
California	926	699	980	730	1,077	1,027	1,058
Oreg. and Wash	393	327	402	366	575	529	569
Totals	17,249	14,006	17,224	14,222	30,891	29,447	29,663

EXPORTS AND IMPORTS OF HYDRAULIC CEMENT, BY MONTHS, IN 1930 AND 1931

Month	Exports				Imports			
	1930		1931		1930		1931	
	Barrels	Value	Barrels	Value	Barrels	Value	Barrels	Value
January	82,387	$293,135	41,199	$115,678	201,609	$207,461	97,057	$132,937
February	64,267	217,798	25,703	88,989	114,455	119,717	22,370	26,250
March	117,563	357,896	54,599	144,579	43,622	59,981	70,532	80,686
April	57,419	200,217	40,478	116,564	140,871	178,226	54,717	61,728
May	57,423	198,170	.....	.....	94,696	111,998	.....	.....
June	82,077	223,639	.....	.....	55,356	74,370	.....	.....
July	47,082	166,577	.....	.....	12,404	20,973	.....	.....
August	49,031	167,579	.....	.....	35,323	39,029	.....	.....
September	46,594	153,384	.....	.....	51,096	59,721	.....	.....
October	62,690	190,305	.....	.....	75,284	84,364	.....	.....
November	50,495	151,555	.....	.....	109,124	125,448	.....	.....
December	38,680	134,260	.....	.....	44,157	59,641	.....	.....
Totals	755,708	2,454,515	.....	.....	977,997	1,140,929	.....	.....

PRODUCTION AND STOCKS OF CLINKER BY MONTHS, IN 1930 AND 1931 (*In thousands of barrels*)

Month	Production		Stocks End of Month		Month	Production		Stocks End of Month	
	1930	1931	1930	1931		1930	1931	1930	1931
January	10,504	8,129	9,646	10,384	July	15,069	.....	11,684	.....
February	10,008	7,473	11,572	11,946	August	15,244	.....	9,275	.....
March	13,045	9,586	13,503	13,318	September	14,577	.....	7,783	.....
April	15,025	11,540	15,164	13,691	October	13,895	.....	7,266	.....
May	16,607	13,213	14,668	13,009	November	11,639	.....	7,758	.....
June	15,895	.....	13,452	.....	December	9,484	.....	8,809	.....

Medusa Portland Places Mortar Cement on Market

A new cement to be used with sand to produce mortar for laying dimension stone has been placed on the market by the Medusa Portland Cement Co., Cleveland.

The cement, being marketed under the brand "Stoneset," is non-staining, white in color, and waterproofed. According to tests, the initial set is reached in 3 2/3 hours with final setting time 7¼ hours. Tensile strengths for a 1:3 mortar are 128 at 3 days, 174 at 7 days and 278 lb. per sq. in. at 28 days. Compressive strength for the same mixture is reported as 834 at 3 days, 1,188 at 7 days and 2,120 lb. per sq. in. at 28 days.

Book Review

A MANUAL OF THE SLIDE RULE, *by J. E. Thompson, dept. of mathematics, Pratt Institute.* 220 pages, illustrated. D. Van Nostrand Co., 250 Fourth Ave., New York, N. Y. Price $1.50. This is a popular discussion of the history, principles and practical uses of the "slip-stick." It explains the ordinary arithmetic calculations, reciprocals, powers and roots, trigonometric scales, fixing the decimal point, proportion, polyphase rules, log-log rules, and exponentials; and presents many typical problems with their simplest slide-rule settings. While a major portion of the book is devoted to calculations with the Mannheim type of rule, the last chapter explains circular and cylindrical modifications.

Traffic News and Comment

Recent I. C. C. Decisions

Cement.—The Commission has found that the rates on cement from various points covered by the following complaints to destinations in Arkansas and Louisiana were not unreasonable, and have dismissed the complaints. I. C. C. Docket No. 22,577, Dewey Portland Cement Co. et al. v. A. & L. M. et al., and Sub. 1, Lehigh Portland Cement Co. v. Same, and Sub. 2, Same v. A. G. S. et al.; No. 22,508, Arkansas General Construction Co. v. A. D. & N. et al.; No. 22,675, Darragh Co. et al. v. A. T. & S. F. et al.; No. 22,676, G. A. Leiper & Co. et al. v. C. R. I. & P. et al.; No. 22,541, M. D. L. Cook v. M. P. et al.; No. 22,418, Parlor City Lumber Co. Inc., v. M. P. et al., and No. 23,647, Consolidated Cement Corp. v. A. T. & S. F.

Lime.—The rates on lime from Engle, W. Va., to destinations in Trunk Line territory and in Ohio have been found to be not unreasonable or otherwise unlawful and has dismissed the complaint. I. C. C. Docket No. 23,180, Washington Building Lime Co. v. Arcade & Attica et al.

Sand and Gravel.—Division 4 has found the rate on sand and gravel from Johnsonville, Tenn., to Glasgow, Ky., unreasonable to the extent it exceeded $1.40 a net ton and has awarded reparation in I. C. C. Docket No. 23,668, T. L. Herbert & Sons v. L. & N. et al.

Examiners' Reports

Cement.—Examiner H. P. Haley recommends reparation of $12.54 on account of inapplicable rate on cement from York, Pa., to Trident, Mont. The applicable rate of 83½ cents was reduced by the combination rule which was the lowest combination over the route of movement. I. C. C. Docket 24,333 Medusa Portland Cement Co. v. C. B. & Q. et al.

Crushed Marble.—Examiner W. M. C. Cheseldine proposes that the rates on crushed marble from Gantt's Quarry, Ala., to destinations in Texas and other southwestern states are unreasonable and unduly prejudicial to the extent they may exceed 10 per cent. of the first class rates in southwestern revision, subject to the rates contemporaneously maintained on crushed limestone in bags, in box cars, from Whitestone, Ga., to the same destinations as maxima. He recommends a Mississippi crossing charge for use at Memphis, Tenn., of 8 cents a net ton and 10 cents for crossings below Memphis. I. C. C. Docket No. 23,626, Alabama Marble Co. v. L. & N. et al.

Crushed Stone, Sand and Gravel.—Examiner Burton Fuller in making his proposed report on road-building materials to destinations in Illinois covered by several grouped complaints has attempted to develop a rate structure that would result in a fair relationship between producing points, was properly aligned with rates established or prescribed in other cases to the same general territory, and would earnings which would be fair to the carriers giving due consideration to distance and other transportation conditions and the group and differential nature of the adjustment. Hundreds of key rates were recommended for prescription by the Commission for both state and interstate application with the provision that rates to local destinations should be the same as to the first key destination next beyond and that the rates prescribed should apply to a minimum of 90 per cent of the marked capacity of the car except that when car is loaded to full visible capacity actual weight will apply. I. C. C. Docket No. 21,939, reopened, I. & S. No. 3,093, sand, gravel and crushed stone from Indiana points to destinations in Illinois; No. 21,372, Ohio & Indiana Stone Co. et al. v. C. C. C. & St. L. et al; No. 23,707, Dickason Sand & Gravel Co. v. B. & O. et al.; and No. 24,298, Montezuma Gravel Co. v. B. & O. et. al.

New Complaints Filed

Ground Limestone.—Unreasonable rates on ground or pulverized limestone from Engle, Martinsburg and Millville, W. Va., to points in New Jersey are alleged and new rates and reparation are sought in I. C. C. Docket No. 24,432, Washington Building Lime Co., et al., Baltimore, Md., v. Atlantic City R. R. et al.

Ground Limestone and Gypsum.—Unreasonable rates on ground limestone from St. Louis, Mo., to High Point, N. C., and on gypsum from Easton, Pa., to the same destination are alleged and new rates and reparation are sought in I. C. C. Docket No. 24,439, Marietta Paint and Color Co., High Point, N. C. v. B. & O. et al.

Talc.—A complaint of unreasonable rates on talc from Emeryville and other New York points to Sheldon Springs, Vt., has been made and new rates and reparation asked for in I. C. C. Docket No. 24,435, Missisquoi Pulp and Paper Co. et al. Sheldon Springs, Vt., v. N. Y. C. et al.

Fourth Section Relief

Plaster and Gypsum Products.—Relief from application of the long and short haul clause of Section Four has been granted carriers parties to Jones' I. C. C. 2,008, on his application 14,-251, to apply on rates from producing points in Mich., Ohio and Ill., to points in C. F. A. Territory east of the Ind.-Ill., state line. Rates are to be made by application of the distance scale shown below. The rate to a destination via all routes will be the same as the rates made by application of the scale over the shortest route, subject to the usual restrictions. Rates in cents per 100 lb. F. S. O. No. 10,605.

Miles	Rate	Miles	Rate	Miles	Rate
5	7	110	13	360	18.5
15	7.5	130	13.5	400	19
20	8	140	14	440	19.5
30	8.5	150	14.5	480	20
35	9	160	15	510	20.5
45	9.5	180	15.5	540	21
50	10	200	16	580	21.5
60	10.5	230	16.5	610	22
70	11	260	17	640	22.5
80	11.5	300	17.5	680	23
90	12	330	18	700	23.5
100	12.5				

Suspension Orders

Limestone.—Mo-Ill. R. R. I. C. C. F-141, Item 55, page 2, and on title page thereof cancellation notice in so far as it cancels schedules continued in force by reason of this suspension effective May 30, has been suspended until Dec. 30. This tariff covers stone from Missouri points to Kellogg, Ill. I. & S. Docket No. 3,603.

Mo-Ill. R. R. I. C. C. F-134, circle reference mark 13 on page 2, and all provisions in connection with stations indexed No. 12,303 to 12,325 inclusive on page 3, and provisions shown under caption "Correction" and explanation of circle reference mark 13 on page 5, effective May 31 suspended until Dec. 31. Covers limestone from Mosher, Mo., to Illinois points. I. & S. Docket No. 3604.

Rate-Committee Docket

New England Freight Assn.

Cement.—To establish the same rate on cement in container car service as now applies on this commodity in ordinary freight equipment, it is proposed to establish the present rate of 13 cents (applying in ordinary freight service), on cement in shipping containers loaded on container cars, c. l. min. wt. 120,000 lb., from Hudson and Hudson Upper, N. Y., to Mt. Kisco, White Plains, Wingdale, and Carmel, N. Y., to include transfer of load from cars at destination. Docket No. 22,838.

Crushed Stone.—Shippers propose a reduction in the rate on stone (broken or crushed) in bulk, in open top cars, c. l. min. wt.[1], from Branford (Pine Orchard Quarry), Conn., to Newport, R. I., from $1.45 a net ton to $1.20, to meet barge competition. Docket No. 22,826.

To meet motor truck competition carriers propose to reduce the rate on crushed stone, c. l. min. wt.[1], from West Quincy, Mass., to Hanover and So. Hanson, Mass., from 85 cents to 50 cents a net ton, and to Kingston, Mass., from 90 cents to 50 cents a net ton. Docket No. 22,862.

Sand and Gravel.—To meet motor truck competition the carriers propose to reduce the rate on common sand and screened or crushed gravel, c. l. min. wt. 50 net tons, from Manchester, N. H., to Canobie Lake, N. H., from 60 cents a net ton on sand and 70 cents a net ton on gravel, to 50 cents a net ton on both commodities. Docket No. 22,860.

To meet motor truck competition the carriers propose to reduce the rates on common sand and screened or crushed gravel, c. l. min. wt. 50 net tons, from Westboro to Newport, N. H., from 70 cents to 60 cents a net ton on sand, and from 80 cents to 70 cents a net ton on gravel. Docket No. 22,861.

Trunk Line Assn.

Cement.—Carriers propose to establish rates on cement on the basis of 114 per cent. of I. C. C. Docket 12,710 scale, from Northampton (Lehigh District), Pa., Alsen, Binnewater, Brixment, Buffalo, Hudson, N. Y., Security-Union Bridge, Md., York, Martinsburg, Pa., Jamesville, Portland Point, N. Y., Swedeland-West Conshocken, Pa., Glens Falls, Howes Cave, N. Y., Bessemer, Wampun, New Castle, Walford, West Winfield, Neville Island, Pa., and Hagerstown, Md., to Plumadore, Loon Lake, Lake Kushaqua, Onchiota and Saranac Lake, N. Y. Rates range from 14½ cents to 22 cents per 100 lb. Docket No. 27,086.

Crushed Stone.—Shippers at Oriskany Falls, N. Y., have proposed a rate of 30 cents per net ton on crushed stone, c. l. min. wt.[1], with a minimum charge of $15.00 per car, to Bouckville, N. Y., to meet motor truck competition. The present rate is 75 cents per net ton. Docket No. 27,056.

Shippers at Ashkum, Pa., have asked for a rate on crushed stone and crushed stone screenings, c. l. min. wt.[1], to Manns Choice, Pa., of 50 cents a net ton, to expire Nov. 1, 1931, and to apply only when shipment is made in lots of 10 cars or more at one time. Docket No. 27,077.

Central Freight Assn.

Amiesite.—Reduced rates on crushed stone coated with oil, tar or asphaltum, from Jamestown, N. Y., to various points in Ohio, Pa., and N. Y., are proposed by the carriers. Representative rates are shown below. Complete exhibit will be furnished on request. Docket No. 28,644.

To	Proposed
Conneaut, O.	$1.42
Adamsville, Pa.	1.42
Shenango, Pa.	1.42
Ashtabula, O.	1.53
Erie, Pa.	1.30
Frewsburg, N. Y.	.96
Irvineton, Pa.	1.07
Pittsburgh, Pa.	1.99

Shippers of crushed stone coated with oil, tar or asphaltum, at Keyport, Ind., have asked for publication of commodity rates to various destinations. Representative rates are shown below. Complete exhibit will be furnished on request. Docket No. 28,677.

To	Proposed
Decatur, Ind.	$1.42
Van Wert, O.	1.53
Hartford City, Ind.	1.19
Portland, Ind.	1.42
Celina, O.	1.53
Grand Ledge, Mich.	2.11
Sturgis, Mich.	1.53
Grand Rapids, Mich.	1.99
Kalamazoo, Mich.	1.76
Big Rapids, Mich.	2.68

Cement.—Shippers at Castalia, O., have proposed a rate on cement, c. l. min. wt. 80,000 lb., to Rocky River, O., of 7 cents to alternate with the present rate of 8½ cents on a c. l. min. wt. of 50,000 lb. Docket No. 28,642.

Crushed Stone.—It is proposed by shippers that a rate of $1.85 a net ton on crushed stone, limestone and agricultural limestone in open top cars, from Spore, Ohio to Swiss, W. Va. The present rate is $2.15. Docket No. 28,647.

Plaster.—Shippers at Port Clinton and Gypsum, O., propose an increase in the rate on plaster and other articles as per item 230 of the tariff to Scottdale and Mt. Pleasant, Pa., from 17 to 17½ cents for B. & O. delivery. The rate for P. R. R. delivery is now 17½ cents. Docket No. 28,686.

Roasted Dolomite.—Shippers at Durbin, Ohio have asked that the rate on roasted dolomite, c. l. min. wt. [1] to Detroit, Mich., be reduced from $2.50 to $1.97 a net ton. Docket No. 28,646.

Southern Freight Assn.

Ground Limestone.—Carriers propose revision of the rates on ground limestone intraterritorially, between points in Southern territory, on the basis of mileage scale substantially the same as prescribed in I. C. C. Docket No. 22,771. Copy of the proposed scale will be furnished on request. Docket No. 55,246.

Southwestern Freight Bureau

Carbonate of Lime.—Shippers at Mosher, Mo., have asked for a rate of 20 cents per 100 lb., on carbonate of lime in bags, barrels or boxes, in bulk, c. l. min. wt. 40,000 lb., to Chicago, Ill., to allow them to meet the competition with precipitated chalk imported from England. Docket No. 23,054.

Texas-Louisiana Bureau

Lime.—Shippers at Dittlinger, Round Rock, and McNeil, Tex., are to have the advantage of a 17½ cent rate on lime, c. l. min. wt. marked capacity of car but not less than 30,000 lb., to Houston, Galveston and Texas City, shipside, for export, under proposal by the carriers. The present rate is 20½ cents to New Orleans, shipside, the proposed rate being three cents less than for a distance 350 miles less. Docket No. S-5,989-6.

Trans-Continental Freight Bureau

Wallboard.—Shippers of wallboard request that Item 1,743, Tariffs 1-J and 4-F, be amended to permit stopping in transit to partly unload. Docket No. 11,986.

[1] The proposed car-load minimum weight will be 90 per cent. of the marked capacity of the car except that, when the car is loaded to full cubical or visible capacity, the actual weight will apply.

Urges Lime Producers Broaden Market by Promoting Agricultural Sales

IT is general knowledge that the value of calcareous material in soils is invaluable for the successful growth of certain agricultural crops, but there are many who do not realize or fully appreciate the importance of lime in farming.

Plant-food elements are taken from the soil in two ways: by the plants as food and through leaching in drainage waters. Losses due to either cause are important but the two combined make depletion of some elements especially rapid. Chief among these are several basic or alkaline elements such as calcium, sodium, potassium and magnesium. The acid-forming elements suffer comparatively smaller losses from leaching with one exception, that very vital and economically important plant food, nitrogen. Of the basic elements mentioned, calcium suffers a drainage loss, in most cases equal to or greater than the other three combined.

This gradual elimination of the bases, occurring constantly year in and out creates an unbalanced soil condition in which the acid elements predominate, resulting in what is termed an acid or sour soil. It is common knowledge that the elements calcium and magnesium are most economically replenished by applying a liming material such as burnt or hydrated lime or finely pulverized limestone.

Many of our most important farm crops will not produce efficiently in acid soils. To be sure, a proper application of commercial fertilizers, in most cases, increases production but not always to an economical maximum.

Lime neutralizes acidity by supplying the soil with the basic elements in which it is deficient. By causing this neutralization, the soil and soil solution become more tolerant to the plants themselves and to the bacteria which act on the organic materials and are so important in decay, ammonification, nitrification and nitrogen fixation.

Experimental evidence points to the fact that some of the mineral elements, as phosphorus and potash, which exist in an insoluble form are made available through the activities of other bacteria which also favor a lime-rich soil. Often certain toxic minerals, such as alumina, become available in acid soils and inhibit plant growth. These are precipitated and tied up in an insoluble form by lime.

In addition, lime has the ability to flocculate the fine particles of clay and

(Continued on page 85)

Financial News

The information contained in these financial pages is given with the understanding that any statement on the part of this magazine or any of its staff, as to the responsibility or standing of any person, firm or corporation, or as to the value of any property or securities is a mere expression of opinion, given as a matter of service to the readers of PIT AND QUARRY, *for which no responsibility in any way is to attach to this magazine or to any of its staff.*

Earnings Statement of N. Y. Trap Rock Corp.

Consolidated earnings of the New York Trap Rock Corp., of New York, N. Y., for the years 1929 and 1930, have been reported as follows:

	1930	1929
Net operating profit	*$2,884,294	$3,041,954
Other income	60,264	69,241
Gross income	$2,944,558	$3,111,196
Interest charges	448,272	423,002
Provision for depreciation and depletion	509,495	421,661
Provision for doubtful accounts	39,375	30,496
Provision for federal and state taxes	297,992	239,761
Other deductions	17,704	6,669
Portion applicable to minority stockholders	11,269	.....
Net income	$1,620,451	$1,989,605
Previous surplus	3,897,657	2,838,141
Credit adjustments	97,668	.....
Total surplus	$5,615,776	$4,827,746
Dividends on preferred	140,000	140,000
Dividends paid minority stockholders	.....	.....
Dividends on common stock	.....	540,000
Loss on plant	.....	245,909
Adjustments	13,014	4,179
Adjustments, workmen's compensation	30,000	.....
Profit and loss surplus	$5,432,762	$3,897,657
Shares common stock outstanding (no par)	180,000	180,000
Earnings per share	$8.22	$10.28

* After deducting selling and general expenses (in 1930, $440,099).

Bondholders' Protective Committee Is Organized

The Consolidated Cement Corp., Chicago, Ill., which defaulted on the principal of its 6½-per cent. notes due March 1, 1931, has formed a protective committee for the benefit of noteholders. This committee includes Robert A. Drum, Leslie N. Duryea, Nathan L. Jones, Fred Mosher, W. B. Prickitt, P. D. Stokes and William H. Wildes. It is stated that the company endeavored during recent months to develop a plan which would be fair to both the noteholders and the company, and recently perfected such a plan, but one stockholder, who is also a director of the company, succeeded in obtaining a temporary injunction preventing the company from offering this or any other plan of refunding the notes without the approval of the court. An appeal from this injunction has been entered.

The committee points out that in the period during which the 6½-per cent. notes were outstanding the company was successful in improving property and reducing manufacturing expense by about 10 per cent. In addition to retiring $400,000 first-mortgage bonds and $100,000 of the 6½-per cent. notes and expending $750,000 for plant improvement, the company was able to increase its working capital from April 1, 1926, to December 31, 1930, by 25 per cent. This improvement was accomplished in spite of a decline in tonnage of cement shipped during the past three years, and despite a drop in price per barrel realized, which in 1930 was 18c less than in 1926.

Lehigh Portland Cement Omits August 1 Dividend

The Lehigh Portland Cement Co. of Allentown, Pa., has omitted the quarterly dividend of 25 cents on the common stock, due August 1.

Ideal Cement Distributes Its Quarterly Dividend

Directors of Ideal Cement Co. have declared the regular quarterly dividend of 75 cents a share on common stock calling for the distribution of $343,703.25 to stockholders of the company on July 1.

The dividend is payable to stock of record June 15.

When the directors acted they brought the amount of money to be paid out to bond and stockholders on July 1 to $447,353.25, as that day is the interest date for the company's debentures on which $103,650 interest will be disbursed.

Officers reported that the company was in an excellent cash position and directors were told that the book value of the common stock is around $50 a share.

Warner Company Places Common on $1.00 Basis

The Warner Co., Philadelphia, has declared a quarterly dividend of 25c on the common stock, placing the issue on a $1 annual basis, against $2 previously. The dividend is payable July 15 to stock of record June 30.

The company has also declared the regular quarterly dividend of $1.75 each on first and second preferred stocks, payable July 1 to stock of record June 15.

Kelley Island Lime Net Profit $515,210 in 1930

Kelley Island Lime & Transport Co., of Cleveland, O., reports for year ended December 31, 1930, net profit of $515,210 after charges, depreciation, depletion and federal taxes, equivalent to $1.66 a share on 308,952 no-par shares of capital stock.

This compares with $917,615 or $2.97 a share in 1929.

Georgia Kaolin Concern Will Burn Natural Gas

Edgar Bros., Inc., kaolin producer at McIntyre, Ga., has closed a contract with the Georgia Natural Gas Corp., Birmingham, Ala., to furnish the company's entire fuel requirements with natural gas. The company is expending $30,000 for laying a pipeline and installation of meters and burning equipment for use of natural gas in its 1428 rated horsepower boiler installation. The gas is to be transported by Southern Natural Gas Corp

CURRENT DIVIDENDS

Company	Class of Stock	Dividend Rate	Holders of Record	Payable	Company	Class of Stock	Dividend Rate	Holders of Record	Payable
Alpha Portland Cement	Preferred	$1.75 qr.	May 20	June 15	Lawrence Portland Cement	Common	$1.00 qr.	June 15	June 30
Alpha Portland Cement	Common	$0.25 qr.	July 1	July 25	Lehigh Portland Cement	Preferred	$1.75 qr.	June 13	July 1
Canada Cement Co	Preferred	$1.62½ qr.	May 30	June 30	Leslie-California Salt	Common	$0.20 qr.	June 1	June 15
Canada Paving & Supply	Preferred	$1.75 qr.	May 15	June 1	Lock Joint Pipe	Common	$0.67 M	June 30	June 30
Cleveland Quarries	Common	$0.75 qr.	May 15	June 1	Material Service	Common	$0.50 qr.	May 15	June 1
Consolidated Rock Products	Preferred	$0.44 qr.	May 15	June 1	McWilliams Dredging	Common	$0.37½ qr.	May 15	June 1
Dufferin Paving & Crushed Stone	1st Pfd.	$1.75 qr.	June 19	July 2	New York Trap Rock	Preferred	$1.75 qr.	June 20	July 1
Fitzsimons & Connell	Common	$0.50 qr.	May 21	June 1	Santa Cruz Portland Cement	Common	$1.00 qr.	June 20	July 1
General Aggregates	Common	$0.25 qr.	July 1	July 15	Superior Portland Cement	Class A	$0.27½ M	June 23	July 1
General Asphalt	Common	$0.75 qr.	June 1	June 15	Texas Gulf Sulphur	Common	$0.75 qr.	June 1	June 15
Ideal Cement	Common	$0.75 qr.	June 15	July 1	United States Gypsum	Preferred	$1.75 qr.	June 15	June 30
International Salt	Common	$0.75 qr.	June 15	July 1	United States Gypsum	Common	$0.40 qr.	June 15	June 30
International Portland Cement	Common	$0.25 qr.	.....	June 30	Warner Co	1st Pfd.	$1.75 qr.	June 15	July 1
Kelley Island Lime & Trans.	Common	$0.50 qr.	June 20	July 1	Warner Co	2nd Pfd.	$1.75 qr.	June 15	July 1
					Warner Co	Common	$0.25 qr.	June 30	July 15

Review of Foreign Practice

How Certain Admixtures Affect Portland Cement

The tremendous development of construction activity in the U. S. S. R. has brought with it a great demand for construction materials and cement materials. Even the erection of new cement mills and the expansion of old mills is not succeeding in meeting the demand, so that the capacity of existing plants must in some way be increased. One way of accomplishing this result is to produce the cement in a less concentrated form than ordinarily; that is, to mix with the cement clinker, at the time of grinding, certain "neutral" substances that increase its volume, and the tests reported here have as their purpose the determination of the suitability of such substances.

The materials used were chalk, dolomite, marl, and others, the dolomite and marl being admixed either in their raw state or in a pulverized condition after heat treatment of some kind. The essential material for the tests was cement from the Kramatorskaya plant of the Uralsilikattrust, to which were admixed marl, chalk and dolomite, dried and ground in a laboratory ball-mill. The cement was mixed with the respective admixtures in the same ball-mill, with a smaller charge of balls. Tests were made on mixes with 1, 2, 5, 10 and 30 per cent. of each admixture, and each kind of "thinned" cement was then tested in 1:3 mixes according to standard procedure.

Examination of the results of the tests indicates that the admixtures have little injurious effect on the mechanical properties of the cement. The tensile strength of the "pure" cement is somewhat higher than that of the "mixed" cements; the compressive strength of the latter in many cases surpasses that of the pure cement. The action of the admixtures can be explained in part as follows: The effect of chalk, dolomite, marl and other neutral admixtures is partly densifying, partly absorbent. The solution arising from the hydration coagulates to a jelly and the whole mass becomes more dense. The particles of admixture are inclosed and distributed in the colloidal jelly and are covered with jelly, and not only do not weaken the mechanical properties, but under some conditions increase them. On the basis of these results it can be concluded that the admixtures mentioned should be added to cement in not less than proportions of 10 per cent. to meet the present needs. The admixtures should be added at the time of the grinding of the clinker, and the cheapest material, which is most widely distributed, is chalk.—Prof. P. P. Budnikoff and Doz. M. I. Nekritsch (communication of the laboratory of silicate technology of the Technologic Institute of Kharkov and of the central laboratory of the Ukrsilikattrust, Kharkov, Russia), *Zement*, 20:192-193, Feb. 26, 1931.

Fused Basalt Produced by the Late Dr. Ribbe

The recent death of Dr. Ribbe, who succeeded in producing basalt by casting in forms that were practically impossible to produce by cutting, calls attention to the fused-basalt industry of which he was the founder and which some day may grow to considerable importance. Early attempts to fuse basalt and recast it into the desired forms produced only a brilliant black glass, and Dr. Ribbe began some years ago his experiments that resulted in a process that makes possible its production in granular form, the physical properties of the product being subject to a high degree of control. The furnace with which he finally achieved this result was a cupola with fore hearth, with which he produced some pieces in fairly large size, although his activities were limited by lack of capital. The results of his work make certain several important facts: (1) that it is possible to utilize fused basalt in the electrical and chemical industries; (2) that it is possible to obtain a product of porous texture with or without a coating of dense material; (3) that the coëfficient of expansion of basalt melted and recast is very close to that of iron, to which it adheres; (4) that the material can be cast into a great variety of building-material forms of high strength, impermeable to moisture and insulating against heat and sound. In 1913 Dr. Ribbe founded a company known as Le Basalte, with a plant at Vitry-sur-Seine, accepting only a post as manager. In 1921 this was taken over by the Compagnie Generale du Basalte, with which Dr. Ribbe was not associated.—*Revue des Materiaux de Construction*, No. 257, pp. 79-80, Feb., 1931.

Line Forms with Gypsum to Cast Roofing Tiles

The manufacture of roofing tiles with plain steel press forms is possible only with clay of very favorable properties, such as is found for example in Holland, but does not occur in Germany, where it is highly desirable to use steel forms faced with forms of cast gypsum, from which the clay tile will separate much more easily than from the bare steel. Gypsum for this purpose must, however, be an especially high-quality molding plaster, as the common plaster has not the high uniformity that will allow it to be uniformly porous on all the exposed surface of the form. The gypsum press forms must be made with great care, but, if properly made, will last in the tile press for as many as 600 impressions for the lower form and as many as 1,000 impressions for the upper.—Dr. K. A. Goslich in *Tonindustrie-Zeitung*, 55:146-148, Feb. 2, 1931.

Recent Sand-Lime Brick Patent and Processes

Supplementing previous reports of the same kind (*Tonindustrie-Zeitung* 1922, No. 27, 34 and 42; 1924, No. 72 and 1927, No. 65), the author reviews in a brief way the patents of the last few years dealing with the manufacture of sand-lime brick. Two of these deal with the sand-lime raw material. One is French patent 630,856, by Beylier, Algiers. This covers the manufacture of sand-lime brick from calcareous sandstone, which is burned in a lime kiln and to which water is added in proportion to the lime content to slake. This yields a fine lime (removed by air-separation) and a sand, still rich in lime, which is manufactured into brick in the usual way. The other is German patent 449,267, by K. Hurlimann Sohne, Brunnen, Switzerland, for a process of making sand-lime brick from argillaceous marl, which is first burned and then manufactured into brick.

One patent (German 441,158, by Steinfabrik Watt, Watt, Switzerland) deals with presses, in particular a press for the formation of perforated brick, and one (American 1,745,601, by Harry Williams Charlton, New York) deals with a process for hardening and waterproofing sand-lime brick, involving the blowing out of a part of the steam from the kettle, after the usual hardening process, and the introduction of a solution of natrium stearate into the kettle. The remaining patents discussed—German 503,660, 437,138, 490,788, 497,030, 497,884, 469,576, 452,642, 413,660, and German GBRM 1,089,618—deal with closures for hardening kettles and other pressure vessels.—J. Thamm in *Tonindustrie-Zeitung* 55:261-2, March 2, 1931.

Chain Manufacturer in Business for 59 Years

The S. G. Taylor Chain Co., with general offices and works at Hammond, Ind., during the month of June is observing its fifty-ninth year in the business of producing welded chain and fittings. The concern is still under the active control and direction of the family of its founder, S. G. Taylor. S. G. Taylor, Jr., has been the active head for more than thirty-five years, and his son, E. Winthrop Taylor, vice-president, is the youngest member of the family in the business.

Recent Patents

AMERICAN

Cement and Concrete

Artificial stone and method of producing the same. John B. Bossi, Alston, and Paul Mazzuchelli, Newton, Mass., assignors to Cambridge Cement Stone Co., Brighton, Mass. No. 1,809,329.

Process of making a foamy body (for cellular concrete). John A. Rice, Berkeley, Cal., assignor to the Bubblestone Co., Pittsburgh, Pa. No. 1,807,810.

Crushing and Grinding

Crusher and pulverizer. Harry J. Shelton, St. Louis, Mo. No. 1,808,264.

Automatic control for cone crushers. George W. Bennett, Milwaukee, Wis., assignor to Nordberg Mfg. Co., same place. No. 1,808,914.

Excavating

Excavating dipper. Walter S. McKee, Chicago, Ill., assignor to Kensington Steel Co., same place. No. 1,807,632.

Excavator. Harry Madonna, Conowingo, Md. No. 1,808,311.

Excavator apparatus. Clifford O. Hanson, Tiffin, O. No. 1,808,408.

Excavating apparatus. Clifford O. Hanson, Tiffin, O. No. 1,808,409.

Bucket construction. William M. Venable, Pittsburgh, Pa., assignor to Blaw-Knox Co., same place. No. 1,808,800.

Transportation

Guiding means for trolley-buckets. Harold E. Hallenbeck, Hudson, N. Y., assignor to Gifford-Wood Co., same place. No. 1,808,954.

Trolley-bucket installation. Harold E. Hallenbeck, Hudson, N. Y., assignor to Gifford-Wood Co., same place. No. 1,809,515.

Concrete transporting truck. Philip A. Koehring, Milwaukee, Wis., assignor to Koehring Co., same place. No. 1,809,629.

Sand-handling truck. Elmer O. Beardsley and Walter F. Piper, Chicago, Ill., assignors to Beardsley & Piper Co., same place. No. 1,809,796.

FOREIGN

Blasting

Explosive. The California Cap Co., Oakland, assignee of John A. Hammond, Albany, Calif. Canadian 311,894.

Cement and Concrete

Treatment of raw slurry before burning in a rotary kiln. N. Nielsen. British 341,875.

Process and apparatus for the manufacture of fused cement. S. Kohut. British 342,414.

Crushing and Grinding

Hammer mills. C. Nielsen. British 341,824.

Process of and apparatus for grinding slag or similar iron-containing material. N. Ahlmann. British 341,951.

Method of and apparatus for grinding artificial and natural stone and the like. Vereinigte Stahlwerke Akt.-Ges. British 341,957.

Apparatus for disintegrating ore and similar material. Hardinge Co., Inc. British 342,130.

Lubricating and liquid-seal systems for grinding mills. E. F. Stimson. British 342,568.

Hammers, beaters or the like for pulverizing mills. General Electric Co., Ltd., and D. H. Waymark. British 342,605.

Grinding installation for production of fine dust. Hartstoff-Metall Akt.-Ges. (Hametag), Berlin-Kopenick. German 527,017.

Grinding mill. Gabriel Christian Erasmus Keet, Klerksdorp, Transvaal, South Africa. German 526,915.

Roller-mill device. Johann Aebi, Mannheim. German 526,916.

Drilling

Percussive hand tools. A. E. Horwell and A. E. Horwell, Jr. British 341,483.

Percussive drills and the like. S. Baillie. British 342,356.

Drill chuck. The Chicago Pneumatic Tool Co., New York, assignee of Gustave Maximilian Nell, Detroit, Mich. Canadian 311,916.

Drill-sharpening machine. Holman Brothers, Ltd., assignee of Arthur Treve Holman and Kenneth James Holman, Camborne, Cornwall, England. Canadian 312,362.

Drying

Drying apparatus. O. Pfeiffer. British 341,587.

Drying apparatus. L. N. Lloyd and Phillips Engineering Co. British 341,407.

Method of transmitting heat to and regulating the temperature of driers, heaters and the like. Coke & Gas Ovens, Ltd., and T. B. Smith. British 342,291.

Process for drying and heat-treating of solid or fluid materials. Humboldt-Deutzmotoren Akt.-Ges., Koln-Deutz, Germany. German 527,363.

Air-sealing rotary driers, kilns, etc. Arno Andreas, Munster i. W. German 527,306.

PIT AND QUARRY *will furnish, at its actual cost, a copy of any patent cited here. A charge of ten cents per copy is made by the U. S. Patent Office, Washington, D. C., and readers may procure a copy directly by addressing the Commissioner of Patents, with payment for copies requested. Postage stamps are not accepted by the Patent Office. We will endeavor to obtain copies of foreign patents for our readers but we cannot give assurance in every case for the reason that copies of such patents are not printed for distribution as liberally as are the American copies, nor is there a fixed charge per copy.*

Excavating

Dredgers for dredging valuable alluvial earths. Lobnitz & Co., Ltd., and H. O. Bedgood. British 342,213.

Stripping machine. Mitteldeutsche Stahlwerke Akt.-Ges., Berlin. German 527,162.

Power shovel. The Ohio Power Shovel Co., assignee of John D. Rauch, Lima, Ohio. Canadian 311,962 and 311,963.

Earth-moving device. Raymond L. Harrison, Albuquerque, N. Mex. Canadian 312,065.

Gypsum

Production of gypsum. Rumford Chemical Works, Providence, R. I. German 526,684.

Plasterboard bundling machines. The Canadian Gypsum Co., Ltd., Toronto, Ont., assignee of Charles R. Birdsey, Chicago, Ill. Canadian 311,903.

Wallboard bundling apparatus. The Canadian Gypsum Co., Ltd., Windsor, Nova Scotia, assignee of Charles R. Birdsey, Chicago, Ill. Canadian 311,904.

Kilns

Rotary kilns. J. S. Fasting. British 342,417.

Material-Handling

Distributors for pulverulent or pasty substances. J. E. B. Maillard. British 317,376.

Apparatus for discharging dump cars serving for carrying bulk materials. G. Stahl. British 342,432.

Method of conveying materials of all kinds. G. Schlosser. British 342,454.

Portable conveyor. Lubecker Maschinenbau-Gesellachaft, Lubeck. German 527,294.

Drag scraper for underground work. Demag Akt.-Ges., Duisberg, Germany. German 527,213.

Skip hoist. Demag Akt.-Ges., Duisberg. German 527,291.

Re-loading device. J. Pohlig Akt.-Ges., Koln-Zollstock, Germany. German 527,006.

Loading device. Bamag-Meguin Akt.-Ges., Berlin. German 527,292.

Loading and unloading apparatus. Niederrheinische Maschinenfabrik G. m. b. H., Duisburg-Meiderich, Germany. German 526,947.

Apparatus for handling bulk materials. Dipl.-Ing. Nicolas P. Baganoff and Dipl.-Ing. Alexandre P. Petroff, Leningrad, U. S. S. R. German 526,597.

Pneumatic conveyor with admission funnel and shutting flap. Wilhelm Ahrens, Elmshirn, Germany. Canadian 311,782.

Take-up device for conveyor. Friedr. Krupp Akt.-Ges., Essen. German 525,734.

Apparatus for putting a belt conveyor in operation. Dipl.-Ing. Erich Reents, Berlin-Tempelhof. German 526,013.

Conveyor. James Robert Garner and John Henry Royston, Sheffield, England. Canadian 311,380.

Endless conveyor. Walter Alfred Spriggs, Southsea, Hampshire, England. Canadian 311,648.

Conveying apparatus for pulverized materials. The Fuller Co., Catasauqua, Pa., assignee of Leonard Manico, London. Canadian 311,696.

Loading machine. Norton Anderson Newdick, Columbus, Ohio. Canadian 311,841.

Mixing

Apparatus for mixing comminuted or finely-divided materials. Alfred Bartlett Smith and Clifford Ross Smith, Wolverhampton, England. Canadian 312,038.

Mixer shell for transit concrete mixers. Edward T. Tuller, San Francisco, Calif. Canadian 312,318.

Mixer. Maschinenfabrik Otto Kaiser, St. Ingbert, Saar, Germany. German 525,474.

Process for production of a uniform mixture of pulverulent materials, such as those adapted to the manufacture of cement. Societe Anonyme des Ciments Luxenbourgeois, Luxemburg. German 525,077.

Concrete mixer. Koehring Co., Milwaukee. German 525,620.

Hoist for the skip of concrete mixers. Koehring Co., Milwaukee. German 525,807.

Concrete mixer with tipping drum. Koehring Co., Milwaukee. German 525,621.

Water-measuring apparatus, particularly for concrete mixers. Carl Peschke, Maschinenfabrik, Zweibrucken, Germany. German 525,991.

Screening and Separating

Centrifugal dust separator. Goodlass Wall and Lead Industries Ltd., London. German 525,529.

Dust collector with filter bag. Dipl.-Ing. Alfred Lebrecht, Nuernberg, Germany. German 526,138.

Brush device for screens. Societe Anonyme Schneider, Jaquet & Cie., Strassburg-Konigshofen, France. German 526,059.

Centrifugal mineral separator. Laurits I. Lorentsen, Vancouver, B. C. Canadian 311,637.

Separation of mineral materials. R. Lessing. British 341,949.

Apparatus for separating pulverized solids from a gaseous current. Fours et Appareils stein. British 342,594.

Vibrating flexible screens such as are used in connection with screening-apparatus. A. Johnson and S. Mills. British 342,888.

Stone

Manufacture of bituminous binders for road stone and the like. South Metropolitan Gas Co. and H. Pickard. British 341,901.

Treatment of limestones to give them the appearance of marble. J. Giovannini. British 342,914.

Unclassified

Apparatus for the precipitation of dust. A. E. Davis. British 342,439.

Centrifugal separators for liquids containing solids. G. Ter Meer. British 342,589.

Jigs and like concentrators and classifiers. W. A. Harris. British 342,-682.

Agitator for the preparation of binding or cementing materials. George Miller Thompson, Caledonia, Canada. German 527,285.

Open-pit mining installation. A. T. G. Allgemeine Transportanlagen Ges. m. b. H., Leipzig. German 526,620.

Process for production of artificial marble. Alfred Baumann, Munich. German 526,596.

Process for protecting mines against ground water. A. F. Malchow Akt.-Ges., Neundorf, Germany. German 526,167.

Process and apparatus for the granulation of slag. Mannesmannrochren-Werke, Dusseldorf. German 526,473.

Sand-blast device. Charles Alvin Dreisbach, New Haven, Conn. Canadian 311,406.

Reduction of sulphate minerals. The Canadian Industries Ltd., Montreal, assignee of Joseph P. Koller, Wilmington, Del., and James E. Booge, Newark, N. J. Canadian 311,491.

Air compressor. Paul H. Davey, Kent, Ohio. Canadian 311,594.

Apparatus for preparing phosphate fertilizers. Beverly Ober, Edward Hyatt Wight, William W. Pagon, George Pruett and William W. Traxell, Baltimore, Md. Canadian 311,599.

Molten slag converting device. Theodor Giller, Mulheim a. d. Ruhr, Germany. Canadian 311,622.

Urges Producers Promote Agricultural-Lime Sales

(Continued from page 81)

heavy silt soils into clusters, thereby loosening the texture and permitting better circulation of air and water as well as more economical tillage.

And last, but by no means least, lime supplies the plant-food elements calcium and magnesium. This function is becoming increasingly important as the more refined fertilizing materials are coming into more general use.

The practice of applying lime and fertilizer to soils is growing daily. Both materials are necessary in the program of any farmer who would make money in his business. Lime does not replace commercial fertilizers, nor can fertilizers replace lime. One complements the other. When used together, they put equally important shoulders to the farm-crop wheel and lift it from the mire of unprofitable production.

A 56-page booklet, *Lime in Agriculture,* has recently been published by the National Lime Assn. as Bulletin 190. It contains chapters with the following titles: "Lime and Life," "Soil Liming," "Lime for Various Crops," "Lime in Crop Protection," "Lime in Animal Nutrition," and "Lime in Farm Construction."

The booklet is well illustrated. Its perusal will afford a fund of information for any man who has any interest in the production or sale of lime.

Asphalt Concern Denied Right to Use Trademark

In view of the fact that the Uvalde Construction Co., of Texas, used the trade mark "Valdilithic" for asphaltic or bituminous paving material before R. L. White, of San Antonio, used the term "Valdemix," as a mark for the same products, Assistant Commissioner of Patents, Millard J. Moore has refused to permit the registration of the latter mark in the U. S. Patent Office. He held that the marks are confusingly similar.

The examiner took notice of the fact that the first two syllables of each mark were taken from the word "Uvalde," the name of the Texas county in which the asphalt is mined. Referring to the derivation of the syllables of the term "lithic," and the term "mix," he held they had the same meaning when referred to paving materials. He added:

"I am of the opinion that there was no error in the holding of the examiner of interferences to the effect that when the marks 'Valdemix' and 'Valdilithic' are concurrently used upon materials of the same descriptive properties confusion would be likely to occur in the mind of the public as to the origin or ownership of said materials."

Hoffman Sells Interest in South Bend Concern

George J. Hoffman, president of the South Bend Sand & Gravel Co. of South Bend, Ind., has sold his interest in the company to Julius B. Christman, contractor and a director in the gravel concern, who will assume the presidency and become general manager.

Other officers will remain the same. They are W. Howard Edwards, vice-president; and Herbert H. Hoffman, secretary. Directors of the South Bend Sand & Gravel Co., besides Mr. Christman and Mr. Edwards, are Lloyd Beyrer, James Beyrer, C. R. Moore, J. Fred Christman and Herbert H. Hoffman.

County Road Commission Purchases Gravel Plant

The Benzie County Road Commission, Beulah, Mich., has purchased a gravel pit from Patrick Lenon of Elberta. Equipment for digging, screening and loading, has been ordered and operations will be started as soon as machinery is installed.

New Pre-Mixed Concrete Plant in Alabama Town

The Huntsville Transfer & Building Material Co., at Huntsville, Ala., have started operation of a new ready-mixed concrete plant.

Manufacturers' Publications

Each publication listed below contains information of interest to nonmetallic mineral producers. Readers may obtain, without charge—except where a price may be stated—and without obligation, copies of any of these publications by writing directly to the manufacturers who publish them. Please mention PIT AND QUARRY *when writing.*

Burners, Pulverized-Coal

Fuller Lehigh Circular Burner. 4 p., 3 ill. (Bulletin No. 905. Fuller Lehigh Co., New York, N. Y.) Describes and illustrates a pulverized-coal burner of the turbulent type widely used for firing coal through solid refractory furnace walls with few alterations.

Conveying Belts

Belt Practice. 40 p. Illustrated. (The Diamond Rubber Co., Inc., Akron, O.) Describes and illustrates approved practices in specifying and operating conveyor and elevator belts. Invaluable as a reference book for the plant superintendent.

Crushing

Sledge Wedge Crushers. 8 p., 15 ill. (Catalogue C-95. McLanahan & Stone Corp., Hollidaysburg, Pa.) A new catalogue describing and illustrating the primary features of a single-roll sledge wedge crusher.

Dredging

Clyde Dredge and Dock Equipment. 36 p. Illustrated. (Bulletin J-7. Clyde Iron Works, Duluth, Minn.) Describes and illustrates complete dredges and dredge equipment including hoists, levers, sheaves and capstans. Includes valuable data tables.

Instruments

Brown Potentiometer Pyrometers. 48 p. Illustrated. (Catalogue No. 1101. The Brown Instrument Co., Philadelphia, Pa.) Describes and illustrates a line of potentiometer pyrometers which has a broad application in the measurement and control of temperatures, especially in the higher ranges.

Loaders, Portable

Haiss Model 80 Loader. 8 p. 10 ill. (Bull. 531. Geo. Haiss Mfg. Co., Inc., New York, N. Y.) A new bulletin describing and illustrating a portable bucket loader of 3 cu.yd. per minute capacity. Contains detailed specifications. Bulletin 731, 4 p. 6 ill., describes and illustrates the Haiss Model 50 loader, a smaller edition of the Model 80 machine, having a capacity of 1½ to 1¾ cu.yd. per min. Another leaflet, Bulletin 631, describes and illustrates the Haiss coal loader. This machine has a rated capacity of 4 tons per minute.

Lubrication

The Ideal System of Lubrication. 32 p., 12 ill. (Ideal Lubricator Co., Philadelphia, Pa.) Describes and illustrates a constant and controlled system for applying grease to bearings.

Motors

Type CS Squirrel-Cage Induction Motors. 4 p., 16 ill. (Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.) Describes and illustrates a line of squirrel-cage motors, equipped with sealed-sleeve bearings, for all commercial frequencies and voltages. Ratings are from ¼-hp. upward.

Power Transmission

Gilmer V-Belt Catalog. 84 p. Illustrated. (L. H. Gilmer Co., Philadelphia, Pa.) A new catalogue comprised of two sections—the first devoted to theoretical and practical illustrations of V-belts and their operation in multiple drives for various classes of service. The second or engineering section introduces simple and original formulae for all V-belt calculations.

Pulverizers

Raymond Roller Mills. 4 p., 5 ill. (Raymond Bros. Impact Pulverizer Co., Chicago, Ill.) Describes and illustrates the super, midget, and high-side roller mills manufactured by this company. The kiln mill, which employs air drying in connection with grinding, is also described.

Pumps

Erie High Duty Dredge Pumps. 28 p. 40 ill. (Bull. No. 42. Erie Pump & Engine Works, Medina, N. Y.) Describes and illustrates a series of popular dredge pumps and contains specifications and construction data. Some interesting operation views are shown.

Speed Reducers

Continuous - Tooth Herringbone Speed Reducers and Gears. 96 p. Illustrated. (Catalogue No. 136. D. O. James Mfg. Co., Chicago, Ill.) A comprehensive catalogue and textbook on speed reducers and gears. Describes and illustrates a complete line and contains tables and ratings.

Palmer-Bee High-Efficiency Speed Reducers. 64 p. Illustrated. (Cat. No. 53. Palmer-Bee Co., Detroit, Mich.) A new catalogue which describes and illustrates the basic features of herringbone, worm, and spur-gear speed reducers manufactured by this company. Also contains specification tables and working drawings as well as a section devoted to flexible couplings.

Correspondence

To the Editor: I have read with interest the letter of Aman Moore, president of the Cement Engineering Co., published in the May 20 issue of PIT AND QUARRY. He criticises an article by Blaine S. Smith as follows:

"The second article, by Blaine S. Smith, gives a chart setting forth the fact that the output of Portland cement has increased during the past few years much more rapidly than the consumption. We will grant this point by Mr. Smith, that consumption has not kept up with the total output of Portland-cement plants, but, as president of a large cement company, he certainly knows that the bulk of the increased output is from new plants, modernly equipped with the very latest machinery. When I refer to the very latest machinery I mean kilns over 400 and up to 600 ft. in length."

Although I know there are some kilns over 400 ft. long, I do not remember seeing any account of any from 500 ft. As Mr. Moore mentions kilns "400 to 600 ft. long" three times in his letter, I would like to ask him where there are any kilns ranging, say, from 500 to 600 ft. in length and which have been particularly responsible for the bulk of the increased output the last few years. I have looked over, from cover to cover, the American Cement Directory of 1930, which is the latest edition of this book and which is reliable and lists plants in the United States, Canada, Mexico, Cuba and South America, and find no mention made of plants with kilns of these sizes. It does list quite a few plants erected in "the last few years."

I would also like to know just how many years is meant by, "past few years," and if Mr. Moore is willing to accept seven years, would like to bet him a nice new Stetson hat that the bulk of the increased production of Portland cement during the last few years has not come from kilns of from 400 to 600 ft. in length, and will bet him an additional Stetson hat that none of this increased production has come from kilns 600 ft. in length.

Further on in Mr. Moore's letter I note the following:

"We are about to install, here in Southern California, a plant that will use two kilns 11 ft. 3 in. in diameter and 600 ft. long."

We all know the stupendous scale on which they do things in Southern California, and, in this connection, I am reminded of a story an English visitor told in Los Angeles two years ago during a Regional Safety Conference of the Portland Cement Association. This gentleman was telling how much he admired his visit to the southern part of the state, remarked on the large scale on which everything was done, admired the tall buildings, and wound up by saying that he had just been told that they were thinking of putting up a building 150 stories high. His parting words were, "My God, gentlemen, that is a hell of a tall building even if they never build it." I am under the same impression that those 600 ft. kilns in Southern California would be long kilns even if they were never put up.

COWELL PORTLAND CEMENT CO.
Cowell, Cal. E. D. Barnett, *Supt.*

New Machinery and Supplies

Full 7-Cu. Yd. Capacity in Crawler Dump Wagon

Having recently produced crawler wheels, which are proving very successful for dirt-hauling operations, the Trackson Co., Milwaukee, Wis., has now introduced a complete 7-cu.yd. crawler wagon.

This latest Trackson product, which is illustrated here, is a bottom-dump cart-type wagon designed to meet the requirements of dirt-moving contractors. It has the features that practical operators demand—extra-strong front and rear ends, improved tongue and drawbar connections, a sturdy body that sheds the dirt, a simple, easily-operated door-winding device, greater clearance on the dump, light weight and extraordinary strength, improved design, renewable parts, and, most important of all, crawler wheels which pull easier and which will stand up for a long life of hard service.

The Trackson crawler wagon is strong and light, weighing only 8,800 lb. complete. It is built entirely of steel, with special re-inforcements at the points which are subject to greatest wear and strain. At the front and rear ends, for instance, are box-shaped, cast-steel headers which are much stronger than the channel-steel headers usually found in dirt wagons. Extra-heavy 8-inch pipe provides a straight, tubular tongue of the strongest possible construction, which is clamped between the two front header castings and thus practically becomes an integral part of the frame structure. The tongue leads at an angle direct from the front header of the wagon to the tractor drawbar, which is much stronger than the goose neck type and permits the wagon to make right angle turns just as easily.

Without the flareboard, which may easily be removed or bolted on, the wagon has a loading height of only 61½ in., which makes it the ideal wagon for use with elevating graders. Its wide doors, straight ends, and little side flare enable it to unload quickly and to dump the dirt on the exact spot where the operator wants it. Also, its high bottom clearance of 26 in. permits it to pull onto or off of the dump quickly and easily.

A single lever is used for both dumping the load and winding up the doors, which makes for much simpler and quicker operation. The doors are made of ⅜-in. steel plate, flanged and re-inforced with angles. They are hinged on the inside of the body with flexible hinge connections which permit the doors to move upward if they come in contact with a stone or other solid object when in the dumped position. A cable equalizer keeps both doors shut tight.

The wagon is equipped with Trackson 15-ton crawler wheels.

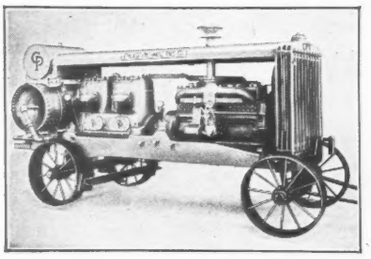
The tractor-drawn crawler-mounted wagon.

Introduces New Portable 4-Cylinder Compressor

A new portable air compressor of 360 cu. ft. per min. capacity has just been introduced by the Chicago Pneumatic Tool Co. of New York, N. Y.

The compressor is of the vertical, four-cylinder, single-acting type. The cylinders, which are completely water-jacketed, are cast in pairs and bolted to the crank-case. They are first bored and then ground to exact size on a precision grinder, assuring absolute roundness, which prevents leakage of air and oil by the pistons. The cylinder heads are cast in pairs.

Inlet and discharge valves are of the Simplate design, especially adapted to high-speed operation. Because of their small clearance, the equalized lift of the valve plates and full port opening, they make possible a high volumetric efficiency and low power consumption per unit of air delivered. The valves are light, durable and simple in construction.



New portable air compressor.

The crank-case is made of close-grained cast iron and is well ribbed for strength. It is fitted with large oil-tight removable doors, which give access to the interior for adjustments and cleaning. The oil pan, made of cast aluminum, has no oil lines connected to it and is easily removed.

The piston is a strong, light casting of close-grained cast iron, accurately turned and ground to exact size. It is fitted with two ventilated oil-control rings.

The connecting rod is open-hearth steel, drop-forged and rifle-drilled, fitted at the piston end with bronze bushing and at the crank end with removable, bronze-backed, babbitt-lined shell.

The crank-shaft is of open-hearth steel, drop-forged, turned and ground. It is provided with accurate counterbalances, which are forged integral with the shaft—insurance against the weights coming off and wrecking the compressor. The shaft is supported by three main bearings provided with removable, die-cast, bronze-backed, babbitt-lined shells, fitted with bearing caps, and located in the upper half of the crank-case.

A gear-type pump driven by the crank-shaft forces oil under pressure to every moving part through the drilled crank-shaft and connecting rods. A large oil strainer is provided and is shrouded by a bell-shaped cover so connected that should the strainer become clogged oil will be drawn by vacuum over the top of the strainer—a device successfully employed by many automobile manufacturers. A pressure gauge is inserted in the system, while a bayonet oil gauge indicates the oil level.

A flexible coupling connects the compressor and engine. It is very simple and compensates for any misalignment of the compressor and engine crank-shafts caused by uneven wear of the bearings. By loosening four nuts on the coupling-plate studs the engine and compressor can be disconnected, thus providing the convenience of a clutch without its disadvantages.

The cooling water for the compressor and engine is circulated by the engine pump through a tubular radiator of large capacity cooled by a fan. The radiator core is built in several sections and is protected by stout steel bars as shown in the accompanying illustrations. Sectional construction reduces the risk of extensive damage and permits of quick, inexpensive replacement in case of accident. A substantial wire-mesh guard encloses the fan, which is driven by three cog belts.

When the air pressure in the receiver reaches a predetermined maximum, the unloader allows air from the receiver to pass to the unloading inlet valves, holding them open and causing the compressor to operate unloaded. When the pressure in the receiver has dropped sufficiently, the unloader operates, venting the air from the valves and causing compression to be resumed.

An ingenious device, the auto-pneumatic throttle, operating in conjunction with the unloader, slows down the engine to an idling speed during the unloaded periods and causes the engine to speed up just prior to loading up of the compressor so that the load is picked up by the engine without stalling. Such operation results in an appreciable saving of fuel and increased life of the machine.

The power plant of this unit is the Hercules Model HXE, six-cylinder, heavy-duty engine. The oil, before reaching the bearings and cylinders, is passed through a Duplex H-W oil filtrator, which removes all foreign matter.

The engine affords a large excess of power capacity over that actually required by the compressor. The moderate speed at which it operates assures a long life, minimum maintenance cost and unusual economy of fuel and lubricant.

Truck and Trailers Are Employed to Haul Gravel

A solution for carrying greater legal payloads is being solved by the Construction Materials Corp. at Chicago with the employment of a four-rear wheel chain drive truck and two trailers.

The company does a large business in the Chicago area and uses the truck equipment for hauling sand and gravel.

The truck is a new Sterling four-rear wheel chain drive six recently announced by the Sterling Motor Truck Co. at Milwaukee. It weighs 20,000 lb. with a 3-way dump body and equipment hauling an equal weight of payload. The trailers weigh approximately 7,500 lb. each and carry 16,500 lb., making a total gross weight of 88,000 lb. and a payload of 53,000 lb.

The trip of 16 miles involves driving through considerable traffic and averages 60 minutes each. Working on a basis of 8 hours a day, the operator averages four round trips a day, hauling a total payload of 424,000 lb., or 212 tons of sand and gravel each day. On the open stretches speed of better than 30 miles per hour is maintained, but city traffic reduces the running time materially.

Four wheel chain-drive truck and trailers.

The truck operates on an entirely new principle in that all four rear wheels are pulled from one single jackshaft but each set independent of the other. This is made possible with the employment of three differentials built as one unit and housed in one single housing. All rear springs, chains and radius rods operate around one common center so that complete traction is obtained regardless of the road conditions. Another feature is the radius rod construction. One set holds the axles crosswise and is provided with springs which deflect sufficiently to permit the rear wheels to track perfectly when making a sharp turn.

The equipment has attracted great attention and it is said that many other hauling tests have been made with equally satisfactory results.

Tractor Driver Controls Operation of Dirt Mover

The accompanying photograph illustrates the Ateco hydraulic dirt mover whose manufacture and sale east of the Rocky Mountains and in foreign countries has been taken over by the Blaw-Knox Co. This machine as illustrated is designed to be drawn by a tractor and is made in two sizes, one rated two cubic yards used in connection with a "30" tractor and the other rated at 4 cu. yd. and designed for use in connection with a "60" tractor.

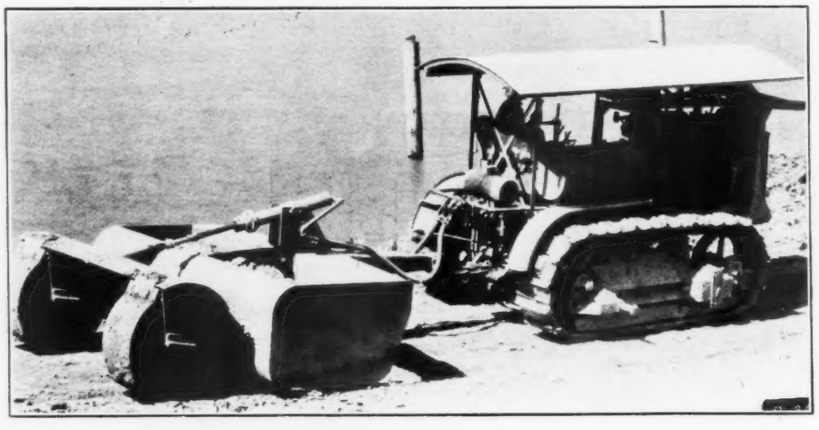
These machines are controlled from the driver's seat on the tractor by means of a double-acting hydraulic cylinder which is part of the dirt mover. Any depth of cut from a thin layer to a full foot in depth is at the command of the operator and the material can be discharged in accurate layers of any thickness up to 18 in.

Its operation is simplicity itself, the construction of the machine is extremely rugged and it moves dirt at extremely low cost up to 600 ft. average haul.

Other items in the Ateco line manufactured and sold by the Blaw-Knox Co. are bulldozers, scarifiers, tamping rollers and combinations of these machines.

Vertical Pump Coupling Eliminates Hollow Shaft

A development that offers a number of real advantages to operators of deep-well turbine pumps is revealed in the vertical pump coupling recently designed by The Ideal Electric & Manufacturing Company, Mansfield, O. The purpose of the Ideal vertical pump coupling is to eliminate the necessity of using a special hollow shaft motor. It removes any possibility of backspin which often results in unscrewing shaft sections. It reduces maintenance costs, and permits easy shaft adjustment with standard solid-shaft motor drives, an advantage never be-



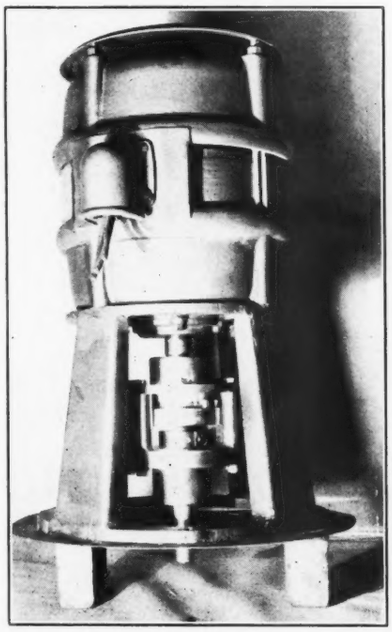
Hydraulic-operated dirt mover.

fore available in connection with deep-well turbine pumps.

Since the drive shaft supports the turbine-pump rotor and since an adjustment must be available for setting this rotor in the vertical position required to give the proper clearance for the pump rotor, it is necessary to provide a means of raising and lowering the shaft through a small distance. Heretofore, this has meant a hollow shaft motor to allow the pump shaft to extend through the motor shaft where, by means of threads on the extended end of the pump shaft and a nut, the required adjustment could be obtained. This adjustment is now provided in the Ideal coupling.

Until now, squirrel-cage motors have been used exclusively on these pumps because of the mechanical difficulties involved in building hollow-shaft direct-current, or slip-ring motors. The use of the Ideal coupling, however, enables any standard solid-shaft vertical motor to be used, including slip-ring, direct-current, and synchronous types, since the coupling contains means of adjusting the position of the pump shaft as required.

The Ideal vertical pump coupling may save hundreds of dollars yearly to an owner of deep-well pumps. When the motor must be removed for pump maintenance or replacement, with the hollow shaft motor, the motor must be jacked up high enough to clear the end



Vertical coupling for deep-well turbine pumps.

of the pump shaft, a distance of from three to eight feet, depending upon the size of the motor. Also, great care must be taken to maintain alignment when the motor is being raised or else the pump shaft will be sprung. This job alone with a large motor takes considerable time and expense. Using the Ideal coupling the motor is raised only high enough to clear the coupling and base—a matter of a few inches. No care need be taken to maintain alignment, either. The saving in time and expense is evident.

The Ideal vertical-pump coupling is made in two types—one with backspin release, and one without this feature. The coupling without the backspin release provides for thrust in both up and down directions as is required in some installations.

The Ideal vertical-pump coupling with backspin release prevents backspin from unscrewing the shaft sections. In operation the lower sides of the pump rotors clear the pump bowls by a small fraction of an inch. When backspin occurs and a joint in the shaft starts to unscrew the shaft lengthens. The result is the lower end of the shaft drops till the pump rotors ride on the pump bowls. Further lengthening of the shaft caused by continued unscrewing action of the backspin causes the upper end of the shaft to rise. When it has risen about ½ in., the drive pins on the coupling are disengaged and the pump shaft then turns freely, preventing any further unscrewing of the shaft joints. Thus the backspin release acts before any joint can unscrew far enough (about 1½ in. minimum) to come apart.

New Stabilizer Mounting for Vibrating Screens

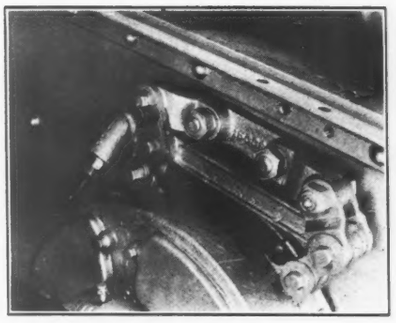
A unique stabilizer mounting for vibrator screens has been announced by Stephens-Adamson Mfg. Co. of Aurora, Ill.

In place of the usual balancing springs at the four corners of the screen, a simple stabilizer unit is now mounted upon one side of the frame to hold the screen at an unchanging angle. The screen is free to vibrate with the eccentric vibrating shaft, but it resists the usual tendency to rock or swing out of the proper screening angle.

The stabilizer consists of two pairs of short arms, jointed elbow fashion and held parallel by a rigid cross bar. One end of each arm pivots on the flywheel housing, which is rigidly fastened to the heavy steel subframe. The other end of each arm is shackled to the screen body as shown in the accompanying illustration.

The two arms are free to swing or bend in any direction, but both must bend and swing together. In operation, the movement of the stabilizer is very slight. However, it effectively prevents the annoying tendency a vibrating screen has to buck and rock when sudden loads are received.

The principal advantages claimed by Stephens-Adamson engineers for the new stabilizer are: (1) The screen body is free to vibrate, but is held *positively* at the desired angle; (2) The screen angle is quickly adjusted to the most effective position by loosening two bolts on one side of screen; (3) The screen has no tendency to buck or rock; (4) Subframe vibration is decreased by eliminating



Vibrating-screen stabilizer.

the reaction of the usual balancing springs; (5) The stabilizer is sturdy and durable. All arms and brackets are of cast steel and the hinge pins are equipped with Nathan automatic oil feeders, which feed oil under constant pressure to the moving surfaces, one filling of oil lasting for several weeks.

Combined Hoist and Body Unit Dumps Three Ways

The need for a hoist and body combination that would dump to the sides as well as the rear has long been recognized, both by dumping-equipment manufacturers and dump-truck users. Several methods have been used at various times to permit side dumping, but the big problem facing the manufacturers was to utilize proven and dependable hoist principles in a side-dumper.

The Wood Hydraulic Hoist & Body Co., Detroit, now announces the new Wood Threeway hoist-and-body dumping unit for any size and type truck chassis. It incorporates the Wood hydraulic principle.

The new unit gives truck operators a method of hoist operation with which they are entirely familiar and which they recognize as most dependable in service. And economies in manufacture have resulted in low prices.

The truck operator can appreciate the time and money saving features of a side-and-rear dump unit. To be able to drive alongside the job and dump the load exactly where wanted without jockeying backwards into position—to approach a fill without danger of backing over the edge—to unload in narrow streets and alleys without obstructing traffic—to spread on road shoulders, as the truck moves along without additional shoveling of materials—all these things spell time-and-trouble saving that runs into real money.

The hoist itself is of the single-unit hydraulic type, consisting of a four-section telescopic cylinder, with the oil pump and reserve tank built-in as part of the complete hoist assembly. It applies lifting power direct to the body-center. The telescoping cylinder, being mounted on double-oscillating trunnions at top and bottom, gives a direct-line hoist thrust at all times.

The cylinder sections are of special wrought steel. They have the exclusive advantage of double-wall construction which not only gives a great increase in strength but also simplifies operation tremendously. The double-wall serves as the return channel for oil after maximum hoisting height is reached, so that there is no danger of over-pressure. Special packing and wiping rings retain the oil and wipe cylinder walls clean of dust and dirt. This hoist operates while the truck is moving or standing, as required for spreading materials. A Wood ball check pump holds the body at any angle in any position.

The line that goes with the Wood Threeway is ruggedly built for hard service. Side gates are 8-gauge steel reinforced by full-length steel torque tube and vertical braces. They are flanged at the top to withstand hard blows. As the body elevates, the sidegate at the lower side opens automatically by gravity, the fall being cushioned by an air plunger. With the return of the body to normal down position the sidegate automatically closes.

Tailgates are either single or double-acting, as desired. The automatic double-acting tailgate opens and closes with the action of the body. And this gate can be provided so that the tailgate posts lower with the tailgate, leaving a flat, unobstructed body floor the full length of the body and the gate. The sidegates, lowering flush with the body and with concealed side posts can be lowered with the tailgate, giving a platform body clear of any obstruction and with great capacity for forms, joists, and other flat materials.

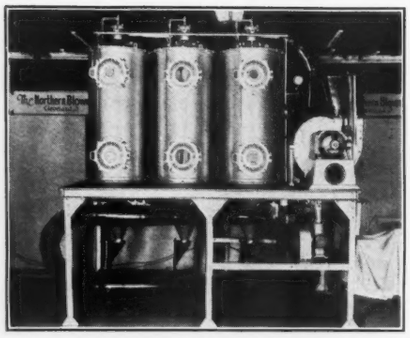
Thus, in the Wood Threeway dumper have been combined the desirable features of dumping units developed in past years, and the latest design of hoist and body. The sub-frame of the new bodies has equal strength and rigidity to both sides as to front and rear. Electric welding of the sub-frame gives it unusual strength.

Orders for the Wood Threeway dumper have been filled for several states and municipalities in different sections of the country and in the Panama Canal Zone. These have in some cases been in service for a considerable time, and only praise has been heard for the economies, efficiency and time-savings obtained.

Air Filter Demonstrated at Ohio Safety Meeting

A series of interesting demonstrations in dust-collecting and fume removal were a feature of the Northern Blower Co. exhibit at the All-Ohio Safety Congress held recently at Columbus, O.

The equipment used for the purpose was a complete, specially-built model (approximately one-half full size), of a Norblo continuous-suction air filter of the type used in cement mills,



Demonstration model of dust collector.

mines and process industries for recovering valuable dust and fumes and for preventing the creation of nuisance and unhealthy working conditions. It consists of three separate cylindrical units fitted with cloth filter bags, and is stated to be capable of recovering more than 99 per cent. of even the finest dust.

Among the experiments shown were the elimination of smoke, the collection of various kinds of dust, and the ability of the filter to continue operating without loss of efficiency even when one of the units was completely shut down and opened up for inspection. In this type of filter, the bags are kept free from dust-clogging by means of a motor-driven timing valve which successively cuts each unit out of the filtering line, reverses the direction of its air-flow while shaking the fabric vigorously, and then replaces the cleaned unit back into the line. The entire operation is automatic. Thus, any of the units may be cut off for any desired period for repairs or inspection by merely closing that particular set of control valves.

Photos of a number of Norblo dust and fume recovery systems were also shown.

Pulsation Absorber on Gauge Simplifies Reading

An improved, all-welded pulsation shock absorber being introduced by The Meriam Co., Cleveland, O., is a simple, yet effective, device for eliminating the unsteady reading so often met with where pressure or vacuum gauges are connected to pipe lines carrying gases or liquids having a pulsating flow. The pulsation is particularly objectionable where the liquid sets up "hammer action," and it is seldom practical to install large air receivers on each pipe line.

The trouble may be cured, however, by placing a pulsation absorber in the small line leading to the gauge. The pulsating pressure from the line is forced to reach the gauge through fine tubing within the compressor air chamber of the gauge. This "air receiver" action, combined with the friction of the fluid in the tubing, absorbs the fluctuations from the gauge line pressure, and gives the true line pressure.

The device is only 7 in. high, there are no moving parts, and all joints are welded to prevent leakage. These absorbers are designed for line pressures up to 10,000 lb.

Golding Sons Co. Costs Cut by Tractor Shovel

Golding Sons Co., of Broad Run, Pa., whose company is a division of the Consolidated Feldspar Corp., have found that the Trackson shovel reduces costs and speeds up operations in their clay pits. They employ a heavy-duty Trackson-McCormick-Deering Crawler Tractor equipped with one of these shovels as shown in the illustration, for stripping, digging the clay, re-conditioning the pits with

The tractor shovel with a full load.

top soil after the clay has been removed and spotting freight cars.

According to Superintendent William Cook this tractor-shovel digs and loads a full car-load of clay in a day, and could easily handle a great deal more if necessary, in addition to its other jobs. It takes the clay out of the pits and loads it into gondola cars by means of a ramp which is built up to the height of the cars. From twelve to fifteen men and three horses were formerly required to operate the pit, but since the Trackson shovel has been in use only two men have been needed for this work.

New Motor-Generator Set Combined into One Unit

A new motor-generator set, designed by the Reliance Electric & Engineering Co., 1088 Ivanhoe Road, Cleveland, Ohio, manufacturers of electric motors, combines the usual a.c. motor and d.c. generator into a single unit. Ruggedness of construction, combined with simplicity of design, minimize attendant troubles and eliminate difficulties usually encountered in aligning two separate units. The induction-motor rotor and the direct-current armature are mounted on the same shaft, requiring only two bearings—one at each end.

These sets can be furnished for operation on either two or three phase circuits of any standard voltage or frequency, and have an output rating of 1 to 5 k.w. at 125 or 250 volts. They may be obtained with either sleeve or ball bearings.

Insurance Problems Discussed

Automobile Depreciation

THE depreciation on an automobile is one of the most unpleasant incidents of the insurance business. Suppose your car is lost or damaged by fire, theft and collision. If your policy is in any one of the many good insurance companies, you will collect all the car is worth. But automobile owners vary widely in their private opinion about the value of their property.

No one realizes how much an automobile depreciates until he gets ready to trade it in. As long as a car holds together the owner thinks of it as being worth the original purchase price. If you buy a $2,000 car, that remains a $2,000 car in your own mind forever. We know of one man who lives in a well-to-do suburb and is meticulously correct about "keeping up with the Joneses." His automobile cost $1,400 four years ago. Its true value today is between $250 and $300. This man would never think of buying a $300 car and would feel socially chagrined to be seen in one. Yet his own car is really just a $300 vehicle, regardless of whether he salves his feeling by calling it a $1,400 car. On business principles you should depreciate your car every month, but most owners mentally wait until they trade in their car and write off all the depreciation in a lump sum.

Various Values

Part of this confusion of thought is due to the fact that every automobile has several different values, such as: (1) Factory list price, (2) complete delivered cost when new, (3) second-hand market value, (4) trade-in value, (5) utility value to owner, (6) insurable value. So when you speak of the value of a car you must have in mind a clear idea of which value you mean.

The factory list price is the true value of a brand new car. Freight charges and extras do not increase the value, because a car is not intrinsically more valuable in Los Angeles than in Detroit. The minute you drive a new car out of the salesroom it becomes a second-hand machine and immediately is worth about ten per cent less than what you paid for it.

Utility of Old Car

The utility of a car to its owner frequently clouds the commercial value. We know a man who is driving a 1924 Buick with perfectly satisfactory results. He has had it painted and overhauled regularly, has driven it less than 30,000 miles, and claims it is just as good for him as a new car. But it is not a new car and there is simply no avoiding the fact that the commercial value is practically nil.

The insurable value of an automobile is definitely related to both the second-hand and the trade-in values, although it is not exactly the same thing as either. In the common language of insurance it would be the cost of a similar new car, minus a deduction for depreciation. An automobile undergoes two kinds of depreciation. In the first place it deteriorates physically through wear and tear roughly in proportion to its mileage. Secondly, it becomes obsolete. Allow a brand new car to stand in a garage without ever being used for a year, and its value will shrink as much as twenty per cent. just because a later model has come out. The second-hand value, occasionally referred to by loss adjusters for purposes of bargaining, is not usually fair to the policyholder. Through most of the country the second-hand market is depressed by forced sales and repossessions, and many of the advertised bargains in it are machines that have been injured by careless driving.

Insurable Value

As a purely practical matter, the insurable value comes close to equalling the trade-in offer on a standard make. The allowance offered you by an established agency of Ford, Chevrolet, Nash, Studebaker or other line with a wide sale is a very accurate measure of the insurable value. The excessive allowances of small manufacturers of course have to be discounted. Generally speaking, the trade-in value includes the second-hand price plus a part of the new salesman's commission and the insurable value included the second-hand price plus an allowance for conditioning the car; these two usually amount to about the same thing.

Granted that your car is constantly depreciating from both usage and obsolescence, the following table, which is used by one of the large insurance companies, will show you approximately the monthly rate of depreciation in value: (Cars are grouped according to factory list price as follows: A—$750 and under, f.o.b factory; B — $751 to $1,000; C — $1,001 to $1,500; D—$1,501 to $2,501; E—over $2,500. Age groups separate cars by months from the time they were purchased new.)

Monthly Rate of Depreciation

Age by Months	A	B	C	D	E
Under 6.....	3%	2½%	2½%	2%	2%
6-18.....	2½	2½	2	1½	2
18-30.....	2½	2	1½	1½	2
Over 30.....	2½	2	1½	1	2

Trucks depreciate somewhat differently from passenger cars. Although they do not grow obsolete as fast, they may be subject to excessive wear and tear and the uses of trucks are so specialized that there is no general open second-hand market.

The foregoing discussion has omitted all points about different insurance companies and policy forms. It has been our purpose only to show you what your car is really worth. The amount you will collect in case of loss depends partly on the liberality of your insurance company, which is a separate subject.

Concrete Design, Quality Makes Constant Progress

At the meeting of the Joint Committee on Standard Specifications for Concrete and Reinforced Concrete, held at the Stevens Hotel, Chicago, on June 22 and 23, considerable progress was made in the consideration of questions of concrete quality and problems of design.

In reference to design it was decided that the scope of the Committee's work should include all structures of concrete or reinforced concrete which require engineering analysis. The magnitude of this program necessitates a departure from the procedure followed in the 1924 Report which was a detailed specification with special application to buildings. The proposal is to confine the present report largely to a statement of the fundamental principles and assumptions upon which rational analysis of concrete structures may be based, with such amplification as is necessary for the design of specific structures.

Concerning the quality of concrete, the dual requirement of a minimum strength and maximum water-cement ratio is proposed. The purpose of the limitation of the water-cement ratio is to avoid the use of unduly lean mixes and thus to safeguard the durability of concrete. A change from the 28-day to 7-day strength requirement is also being considered.

Recent developments in the field of ready-mixed concrete have raised new problems not covered by the former specification. The Committee proposes to incorporate suitable provisions for the control of ready-mixed concrete.

On the subject of concrete reinforcement, the Committee has gone on record as opposed to the provisions of permitting the machining of test specimens for determining the physical properties of deformed bars.

Legal Information for Operators

Independent Contractor Shoulders All Liability

An independent contractor is a person who contracts to do a piece of work according to his own ideas or in accordance with plans and specifications previously furnished to him by his employer, and who has the right to select and employ his own assistants, the employer having no control over the assistants, and no right to direct the manner of doing the work further than to require that it shall be done in compliance with the plans and specifications under which it is contracted to be done. Moreover, this rule is not changed by the fact that, by agreement, the owner for whom the work is being done advances to the contractor pay for his employees, and actually pays them, charging the amount paid to the contractor as against the specified contract price.

The importance of this legal ruling will be recognized when it is realized that an employer of an independent contractor never is liable for injuries caused by or to the independent contractor's employees.

A satisfactory test in determining this question has been said to be: Who has the general control of the work? Who has the right to direct what shall be done, who shall do it, and how it shall be done? If the answer to these questions shows that this right remains in the employer, the relation of independent contractor does not exist between the contractor and the employer. On the other hand, if the employer has not this privilege, it does exist.

For illustration, in General v. Mozier, 30 S. W. (2d) 952, a company hired a man to blast and get out material at $1.25 a ton. The employee did his own timbering and furnished everything else and bought and used his own powder. The employee, to prevent anybody from stealing the powder, dug a hole in the ground about eighteen inches deep, put the can of powder in it and covered up the can with dirt eight or ten inches thick and left. A boy about nine years old was hiding in the bushes not far off, and saw where the powder was hid. He got the can out of the ground, opened it with a nail, and took some of the powder out of the can. Later he lighted it and another boy, who was nearby, was so seriously burned that he died. The parents sued the company for damages. However, since it was held that the employee who hid the can of powder was an independent contractor, the higher Court reversed the lower Court's decision which held the company liable, saying:

"Under the proof clearly the employee worked as he pleased and when he pleased. The master exercised no control over the work. He employed such help as he pleased; he did the work in his own way without any supervision by the company or its exercising any control over him. In addition to this, the master is never responsible for the acts of his servant, unless done within the scope of his employment. . . . The authorities are agreed that in order to render the master liable for the servant's acts they must have been done while carrying on the master's business and within the course of the servant's employment."

Asphalt Co. Ordered to Pay for Boy's Injuries

While it is true that a person is not entitled to recover damages for an injury caused by his own carelessness, yet where it is shown that the degree of negligence of the one being sued was greater than the negligence of the injured person, then the latter is entitled to a recovery.

For instance, in Smolenski v. Cooke Asphalt Co., 233 N. W. 400, an asphalt company left cars, used for hauling asphalt, in a public street. The children in the neighborhood congregated about them and moved them about in their play. A child, while attempting to cross the street, was injured when other children pushed a car against him. The parents sued the asphalt company for damages. In holding the company liable, the Court said:

"Was defendant (asphalt company), under the circumstances, guilty of negligence? If so, was the plaintiff (boy) guilty of such contributory negligence as to bar his right to recovery? . . . Here it is shown that children had repeatedly moved these cars about in play. Defendant (asphalt company) had given orders that, when the cars were not in use, they were to be chained to the tracks. Plaintiff was not injured when playing around the cars. He was injured in crossing the street by the sudden movement of a car left standing unfastened by defendant when he was pursuing his ordinary business and when defendant's cars were not in use."

Double Compensation for Injury Not Permissible

Frequently injured employees collect compensation from their employer under state compensation laws and then sue another to recover damages. Usually double compensation is not allowable.

For example, in Matheny v. Edwards Co., 39 F. (2d) 70, an employee of the owner of property was engaged in wheeling concrete when he was struck by a piece of steel which employees of the contractor on the building permitted to fall from a point above.

The injured employee applied for compensation from the property owner, his employer, under the state laws, and also sued the contractor for damages, alleging that the injury resulted from negligence on the part of the latter. The higher Court refused to allow double compensation, saying:

"Can it be said that the Legislature intended that under such conditions, where the owner's employee is injured through an accident caused by the act of another workman indirectly employed by him, but technically the servant of an independent contractor, there shall be two remedies and double compensation for the injury, whereas, if it is caused by another, employed directly by the owner, there shall be but one remedy and one compensation? . . . When we consider the purpose of the act . . . it was intended that the right to compensation under the act should be in lieu of all other remedies against any of the parties so engaged."

Gypsum-Plant Worker Refused Compensation

A review of the compensation acts of different states discloses that some of them provide compensation when a workman receives an "injury" in the course of his employment, while others make the foundation of such claim an "accidental injury" or an "injury by accident." The Courts in interpreting the various laws have made an important distinction in the use of these words.

Generally it has been held, where the word "accident" is used, the workman suffering from a disease is not entitled to compensation and, where the word "injury" is used, and "accident" omitted, the workman contracting occupational diseases is entitled to compensation.

In the late case of United States Gypsum Co. v. McMichael, 293 Pac. 773, it was disclosed that a state law provides for awards of compensation for "accidental injury."

In this case it was held that disability from inhaling an excessive amount of gypsum dust, resulting in acute bronchitis, is not within the law. In holding the workman not entitled to compensation, the Court said:

"Under our act 'injury' is defined to mean 'accidental injury,' and the basis of a claim for compensation must be a casualty occurring without expectation or foresight; occupational diseases, sustained in the course of employment where from the nature of the work such diseases are likely to be contracted, are excluded as a basis of compensation, for an occupational disease is not an accidental disability."

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